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"A Revision of the Ichneumonidae" (Part II.)
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A REVISION OF THE
ICHNEUMONIDAE

BASED ON THE COLLECTION IN THE
BRITISH MUSEUM (NATURAL HISTORY)

WITH DESCRIPTIONS OF NEW GENERA AND SPECIES

PART II.

TRIBES RHYSSIDES, ECHTHROMORPHIDES,
ANOMALIDES AND PANISCIDES.

BY

CLAUDE MORLEY, F.Z.S. F.E.S.



LONDON

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PREFACE.

The present work, by Mr. Claude Morley, is a continuation of the "Revision" commenced by the same Author in 1912. It includes the Tribes Rhyssides, Echthromorphides, Anomalides and Paniscides.

The thanks of the Trustees are again due to Mr. Rupert Stenton, F.E.S., who has drawn and presented the figure from which the Plate illustrating Part II. was reproduced.

SIDNEY F. HARMER.

BRITISH MUSEUM (NATURAL HISTORY),

January, 1913.

SYSTEMATIC INDEX.

FAMILY—ICHNEUMONIDAE.

SUBFAMILY—PIMPLINAE.

TRIBE—RHYSSIDES.

EPIRHYSSA, Cress 4

(Asia.)

1. carinifrons, Cam. 6
2. flavopicta, Smith* 6
3. japonica, Cam.* 5
4. mulleri, Voll. 5
5. nigerrima, Morl.* 6
6. flavobalteata, Cam.* 7
7. maculicornis, Cam.* 5
8. maculiceps, Cam.* 7
9. bimaculata, Cam.* 7

(America.)

1. speciosa, Cress. 8
2. mexicana, Cress.* 8
3. tricoloripes, Mocs. 8
4. alternata, Cress.* 8
5. amazonica, Mocs. 8
6. histrio, Kriech. 8
7. tristis, Kriech.* 8

RHYSSA, Grav. 9

(Western.)

1. lineolata, Kirby* 10
2. persuasoria, Linn.* 10
3. alaskensis, Ashm. 11
4. humida, Say 11
5. canadensis, Cress. 12

(Eastern.)

1. approximator, Fab.* 13
2. lanaria, Voll. 13
3. mirabilis, Smith 13
4. fulva, Voll. 13
5. fasciata, Smith 13
6. variilineata, Cam. 14
7. fulvipennis, Cam. 14
8. claripennis, Cam. 14
9. mesopyrrha, Mocs. 14

RHYSSA, Grav.—*contd.*

(New Zealand.)

1. fractinervis, Voll.* 15
2. clavula, Colenso 15

THALESSA, Holmgr. 15

(Western.)

1. atrata, Fab.* 15
2. nitida, Cress. 16
3. superba, Schr.* 16
4. lunator, Fab.* 17

(Eastern.)

1. japonica, Ashm.* 18
2. superbiens, Morl.* 18
3. instigator, Smith* 19
4. nobilitator, Smith* 19
5. maculipennis, Smith* 20
6. nigratarsis, Cam.* 20

LYTARMES, Cam. 21

1. maculipennis, Cam. 21
2. hyalinipennis, Cam. 21

APECHONEURA, Kriech. 22

(Paraneura, Morl.) 22

1. rufata, Mocs. 23
2. nigricornis, Mocs. 23

(Apechoneura, Kriech.) 22

3. foveata, Mocs. 23
4. nigratarsis, Cam.* 23
5. carinifrons, Cam.* 24
6. nigriventris, Mocs.* 24
7. pictiventris, Mocs.* 24
8. semilunata, Mocs. 24
9. longicauda, Kriech.* 25
10. major, Morl.* 25
11. minor, Morl.* 25
12. brevicauda, Kriech.* 26
13. terminalis, Brullé* 26

* The species represented in the British Museum are marked with an asterisk.

SYSTEMATIC INDEX—*contd.*

	PAGE
CERTONOTUS, Kriech.	26
1. geniculatus, Morl.*	28
2. vestigator, Smith*	28
3. nitidulus, Morl.	29
4. monticola, Morl.*	29
5. rufus, Mocq.	30
6. labialis, Cam.	30
7. seminiger, Krieg.	30
8. rufescens, Morl.*	30

	PAGE
CERTONOTUS, Kriech.— <i>contd.</i>	
9. annulatus, Morl.*	31
10. apicalis, Morl.*	31
11. humeralifer, Krieg.	31
12. flaviceps, Voll.	31
13. hinnuleus, Krieg.*	32
14. veteratrix, Tosq.	32
15. varius, Kriech.	32

TRIBE—ECHTHROMORPHIDES.

LISSOPIMPLA, Kriech.	33
1. semipunctata, Kirby*	34
2. pacifica, Morl.*	35
3. octoguttata, Kriech.	35
4. concolor, Krieg.	35
5. stupenda, Tosq.	35
6. scutata, Krieg.*	36
7. albopicta, Walk.*	36
8. rufipes, Cam.	36

ECHTHROMORPHA, Holmgr. 36	
1. intricatoria, Fab.*	39
2. bitecta, Morl.*	39
3. exquisita, Morl.*	40
4. maxima, Krieg.*	40
5. plagiata, Smith*	41
6. gnathon, Krieg.	37
7. tridens, Krieg.	38

ECHTHROMORPHA, Holmgr.— <i>contd.</i>	
8. atrata, Holmgr.*	41
9. conopleura, Krieg.	38
10. immaculata, Krieg.	38
11. walkeri, Cam.*	42
12. maculipennis, Holmgr.*	42
13. flavo-orbitalis, Cam.*	42
14. nigricans, Krieg.	38
15. macula, Brullé*	43
16. agrestoria, Swed.*	44
17. insidiator, Smith*	44
18. notulatoria, Fab.*	45
19. inermis, Morl.*	46
20. variegata, Brullé*	46
21. diversor, Morl.*	47
22. hyalina, Sauss.*	48
23. rufa, Cam.*	48
24. semperi, Krieg.*	48

SUBFAMILY—OPHIONINAE.

TRIBE—ANOMALIDES.

EIPHOSOMA, Cresson	51
1. atrovittatum, Cress.	52
2. azteca, Cress.*	52
3. parana, Morl.*	53
4. texana, Cress.*	53
5. annulatum, Cress.*	53
6. pyralidis, Ashm.*	54
7. mexicana, Cress.*	54
8. vitticollis, Cress.*	55

NESANOMALON, Morl.	56
1. dimidiatum, Morl.*	56

XIPHOSOMELLA, Szépl.	57
1. brasiliensis, Szépl.*	57
2. tabascensis, Morl.*	58

METANOMALON, Morl.	58
1. poliendum, Morl.	59

PODOGASTER, Brullé.	59
1. coarctatus, Brullé*	60
2. spilopterus, Morl.*	61
3. albiditarsus, Morl.*	61
4. ruficaudatus, Morl.*	61
5. africanus, Morl.*	62

TRICHOMMA, Wesm.	62
1. ruficoxis, Först.	63
2. occisor, Haberm.	64
3. enecator, Rossi*	64
4. fulvidens, Wesm.*	64
5. minuta, Bridg.*	65
6. albicoxa, Morl.*	65
7. reticulata, Davis.	65
8. nigricans, Cam.*	65
9. productor, Morl.	66

SYSTEMATIC INDEX—*contd.*

	PAGE		PAGE
SCHIZOLOMA, Wesm.	66	ANOMALON, Jur.— <i>contd.</i>	
1. confusa, Ashm.	66	2. carinifrons, Cam.	83
2. regalis, Morl.*	67	3. decorum, Cam.	83
3. amicta, Fab.*	67	4. tinctipenne, Cam.*	83
4. capitata, Desv.*	67	5. apicate, Cam.*	84
5. fulvicornis, Cam.	67	6. binghami, Cam.	84
HETEROPELMA, Wesm.	68	(America.)	
1. fulvicorne, Say.*	68	1. curtum, Norton	84
2. datanae, Riley*	69	2. buccatum, Morl.*	86
3. sonorensis, Cam.*	69	3. ambiguum, Nort.	85
4. calcator, Wesm.*	69	4. nigratum, Nort.*	86
5. orbitalis, Morl.	69	5. peritum, Cress.	85
6. fulvitarse, Cam.*	70	6. semirufum, Nort.	85
7. perornatum, Cam.*	70	7. ferrugineum, Nort.	85
8. nox, Morl.*	70	8. relictum, Fab.*	86
EXOCHILUM, Wesm.	71	9. fumipenne, Cress.*	86
1. tenuipes, Norton*	73	10. anale, Say*	87
2. diabolus, Morl.	73	11. laterale, Brullé	85
3. morio, Fab.*	73	12. orbitale, Cress.*	87
4. acronyctae, Ashm.	74	13. agnatum, Cress.	85
5. texanum, Ashm.*	74	14. hyaline, Norton	85
6. fuscipennis, Nort.	74	15. guatemalenum, Cam.* ..	87
7. chinense, Morl.*	74	16. nigrorufum, Nort.*	88
8. nigrum, Prov.	75	17. luteopectum, Nort.	85
9. australasiae, Morl.*	75	18. vitticolle, Cress.	85
10. brevicorne, Grav.*	72	19. prismaticum, Nort.	85
11. scaposum, Morl.*	75	20. magum, Cresson.*	88
12. circumflexum, Linn.*	76	21. metallicum, Nort.	85
13. neglectum, Morl.*	76	(Australia.)	
14. sulcator, Morl.*	77	1. coarctatum, Brullé.	88
15. trichiosoma, Cam.*	77	2. varicolor, Morl.*	88
16. atrichiosoma, Morl.*	77	SPILANOMALON, Morl.	89
17. giganteum, Grav.*	77	1. elegans, Cress.*	89
18. robustum, Morl.*	78	AGRYPON, Först.	89
19. verticale, Morl.*	78	(Asia.)	
20. orbitale, Morl.*	78	1. villosum, Tosq.	90
21. acheron, Morl.*	79	2. flavifrons, Smith*	90
22. occidentale, Cress.	79	3. caliginosum, Tosq.	91
MAGNIBUCCA, Morl.	79	4. nox, Morl.*	91
1. testacea, Morl.	80	5. variitarsum, Wesm.*	91
BARYLYPA, Först.	80	6. tisiphone, Morl.	92
1. bipartita, Morl.*	80	7. sumatrense, Tosq.	92
2. xanthomelas, Brullé.	81	(Africa.)	
3. flavitarsis, Brullé	81	1. primum, Morl.*	92
4. victoriana, Morl.*	81	2. secundum, Morl.*	93
5. trilineata, Cam.*	82	(Australia.)	
6. perturbans, Morl.*	82	1. ferrugineum, Morl.*	93
ANOMALON, Jur.	82	2. melanura, Morl.*	94
(Asia.)			
1. brachypterum, Cam.	83		

SYSTEMATIC INDEX.—*contd.*

	PAGE		PAGE
AGRYPON, Först— <i>contd.</i> (America.)		PARANIA, Morl.	96
1. scelerosum, Cress.*	94	1. nototrachoides, Morl.*	97
2. lineiger, Morl.*	94	HYMENOPHARSALIA, Morl.	97
3. residuum, Cress.*	95	1. texana, Cress.*	98
4. flaviceps, Cam.*	95	2. virginicensis, Cress.*	99
5. flavopictum, Ashm.*	96	3. mexicana, Morl.*	99
TRIBE—PANISCIDES.			
PANISCUS, Grav.	102	PANISCUS, Grav.— <i>contd.</i>	
(America.)		5. cephalotes, Holmgr.*	121
1. semirufus, Holmgr.	104	6. nigriventris, Brullé*	121
2. brasiliensis, Szépl.	104	7. lineatus, Brullé	121
3. geminatus, Say*	104	8. testaceus, Grav.*	122
4. gerlingi, Schrot.*	106	9. quadrilineatus, Smith	122
5. nodulosus, Morl.*	107	10. orientalis, Cam.	122
6. testaceus, Grav.*	107	11. gracilipes, Thoms.*	122
7. rufus, Brullé*	107	12. capito, Kok.*	123
8. ignotus, Morl.*	108	13. flavolineatus, Cam.	123
9. medius, Ashm.	108	14. montanus, Cam.	123
10. alaskensis, Ashm.	108	(Australasia.)	
11. immaculatus, Morl.*	109	1. latro, Holmgr.	124
12. albovariegatus, Prov.	109	2. constrictus, Morl.*	125
13. albotarsus, Prov.	109	3. incommunis, Szépl.	125
15. subfuscus, Cress.*	109	4. gracilis, Morl.*	125
16. tinctipennis, Cam.*	110	5. ephippiatus, Smith*	126
17. diversus, Szépl.*	110	6. dimidiatus, Morl.*	126
18. fuscipennis, Szépl.*	111	7. productus, Brullé*	126
19. melanostigma, Cam.	111	8. contrarius, Morl.*	127
20. liopleuris, Szépl.*	111	9. antipodum, Vachal	127
21. texanus, Ashm.*	111	10. testaceus, Grav.*	127
22. lucidulus, Szépl.	111	PARABATUS, Thoms.	128
23. lugubris, Spin.	112	1. deceptor, Morl.*	129
(Africa.)		2. whymperi, Cam.*	129
1. errans, Tosq.*	113	3. gansuanus, Kok.	129
2. planipes, Tosq.*	114	4. gracilis, Morl.*	129
3. insulicola, Morl.*	115	5. albipictus, Tosq.*	130
4. madeirensis, Morl.*	115	6. antefurcalis, Szépl.	130
5. melanocotis, Holmgr.	115	7. antipodum, Morl.*	131
6. elegans, Szépl.	116	8. luteolus, Tosq.*	131
7. ocellaris, Szépl.*	116	9. amplus, Morl.*	131
8. parvulus, Szépl.	113	TETRAGONALYS, Morl.	132
9. cephalotes, Holmgr.*	116	1. barbarica, Morl.*	132
10. rufescens, Tosq.*	116	2. pagana, Morl.*	132
11. perforatus, Schulz*	117	PARCA, Morl.	133
12. testaceus, Grav.*	117	1. ocularia, Morl.	133
13. perforator, Smith*	118	OPHELTES, Holmgr.	133
14. aethiopicus, Szépl.*	118	1. glaucopterus, Linn.*	134
(Asia.)		2. chinensis, Morl.*	135
1. laevis, Cam.*	119	WESTWOODIA, Brullé	135
2. grumi, Kok.*	120	1. ruficeps, Brullé*	135
3. intermedius, Cam.*	120		
4. unicolor, Smith*	120		

CATALOGUE OF GENERA AND SPECIES HEREIN
BROUGHT FORWARD AS NEW.

Epirhyssa, Cress.
nigerrima.
Thalessa, Holmgr.
superbiens.
Apechoneura, Kriech.
major.
minor.
Certonotus, Kriech.
geniculatus.
nitidulus.
monticola.
rufescens.
annulatus.
apicalis.
Lissopimpla, Kriech.
pacifica.
Echthromorpha, Holmgr.
bitecta.
exquisita.
inermis.
diversor.
Eiphosoma, Cresson.
parana.
NESANOMALON.
dimidiatum.
Xiphosomella, Szépl.
tabascensis.
METANOMALON.
poliendum.
Podogaster, Brullé.
spilopterus.
albiditarsus.
ruficaudatus.
africanus.
Trichomma, Wesm.
albicoxa.
productor.
Schizoloma, Wesm.
regalis.
Heteropelma, Wesm.
orbitalis.
nox.
Exochilum, Wesm.
diabolus.
chinense.
australasiae.
scaposum.
neglectum.
sulcator.

atrichiosoma.
robustum.
verticale.
orbitale.
acheron.
MAGNIBUCCA.
testacea.
Barylypa, Först.
bipartita.
victoriana.
perturbans.
Anomalon, Jur.
buccatum.
varicolor.
SPILANOMALON.
Agrypon, Först.
nox.
tisiphone.
primum.
secundum.
ferrugineum.
melanura.
lineiger.
PARANIA.
nototrachoides.
HYMENOPHARSALIA.
mexicana.
Paniscus, Grav.
nodulosus.
ignotus.
immaculatus.
insulicola.
madeirensis.
constrictus.
gracilis.
dimidiatus.
contrarius.
Parabatus, Thoms.
deceptor.
gracilis.
antipodum.
amplus.
TETRAGONALYS.
barbarica.
pagana.
PARCA.
ocularia.
Opheltes, Holmgr.
chinensis.

CLASSIFIED SUMMARY OF THE CONTENTS OF PARTS I. AND II.

SUBFAMILY		TRIBE		PART	PAGE
Ophioninae	...	Ophionides	...	I.	3
„	...	Anomalides	...	II.	49
„	...	Paniscides		II.	101
Tryphoninae	...	Metopiides		I.	73
Pimplinae		Rhyssides		II.	3
„		Echthromorphides	...	II.	33

A REVISION
OF THE
ICHNEUMONIDAE.

PART II.

SUB-FAMILY PIMPLINAE.

TRIBE RHYSSIDES.

The feature of the strongly transcarinate mesonotum is so distinct that we may form upon it a small tribe of the Pimplinae under the above name. The species of the seven following genera, which alone share this peculiar character among the Ichneumonidae, are extremely homogeneous and, though certainly closely associated in certain Australian forms with *Ephialtes* and its allies, no hesitation can be experienced respecting the insects falling within the present group.

TABLE OF GENERA.

- | | | |
|------|--|---|
| (4) | 1. Areolet of the wings entirely wanting. | |
| (3) | 2. Scutellum deplanate; antennae not apically incrassate. | EPIRHYSSA, Cress. |
| (2) | 3. Scutellum pyramidal; antennae apically incrassate. | PYRAMIRHYSSA, Mocs. (1 sp., <i>magnifica</i> , Mocs. 1905). |
| (1) | 4. Alar areolet distinctly present. | |
| (10) | 5. Metathorax with no areae; frons not carinate between scrobes. | |
| (7) | 6. Central abdominal segments not discally emarginate; clypeus centrally produced. | RHYSSA, Grav. |
| (6) | 7. Central abdominal segments discally emarginate; clypeus apically truncate. | |
| (9) | 8. Hind tibiae normal; head nearly as broad as eyes. | THALESSA, Holmgr. |
| (8) | 9. Hind tibiae incrassate; head not nearly as broad as eyes. | LYTARMES, Cam. |
| (5) | 10. Metathorax with distinct areae; frons often carinate. | |
| (12) | 11. Frons strongly carinate; terebra usually pale-banded. | APECHONEURA, Kriech. |
| (11) | 12. Frons not centrally carinate; terebra not banded. | CERTONOTUS, Kriech. |

EPIRHYSSA, Cresson.

Proc. Ent. Soc. Philad. iv, 1865, p. 39; *Rhyssonota*, Kriech. Ann. Nat. Hofmus. v, 1890, p. 489.

This genus was erected by Cresson for the inclusion of two Cuban species, differing from *Rhyssa* only in the shorter and stouter antennae, lack of areolet and in the somewhat shorter segments; these are flavous with the abdomen of *E. alternata* immaculate at apices of the three basal segments, which are there black in *E. speciosa*, the type of the genus. Cameron says (Str. Br. R. Asiatic Soc., 1906, p. 115) that *Epirhyssa*, besides lacking the areolet, differs from *Rhyssa* in having the basal segment distinctly longer than the second, whereas in *Rhyssa* he says it is shorter; in 1899, however, he does not appear to have understood the genus at all, since his *E. annulicornis* (Manch. Mem. 1899, No. 3, p. 133) from the Khasi Hills and since found in Burma, is a typical *Xylonomus*, of which the ♀ type is in the British Museum. In 1864, Cresson had already brought forward the black and white *Rhyssa albomaculata*, which I refer to under that genus. *E. clavata*, Provancher (Add. Faun. Canad. Hym. 1886, p. 115, ♀) is probably no more than the female of his *E. crevieri* (Faun. Ent. Canad. 1883, p. 449) and doubtfully distinct from the last-named species, for both occasionally have but an imperfect areolet. Cresson described a third flavous kind with segmental apices infusate, but the wings apically strongly infumate-spotted (Proc. Acad. Philad. 1873, p. 394, ♀—*nec* ♂, *sec* DT., copied by Schm. Gen. Insect. 1907), under the name *E. mexicana* from Orizaba and Cordova; this has subsequently been recorded by Mocsáry from so far south as Brazil; and Champion also took one, now in the British Museum, at San Geronimo in Guatemala (Biol. Centr.-Amer., 262, pl. xi., fig. 2, ♀); a second in the British Museum, taken by Smith on the Sierra de las Aguas Escondidas in Guerrero at 7,000 feet in July, I term var. *immaculata* on account of the lack of black markings on the vertex and segmental apices; it may, however, be distinct because of the hardly emarginate disc of the third and fourth segments and the pale valvular apices. These were followed by the erection of his new genus *Rhyssonota* by Kriechbaumer in 1890, synonymous with the present since, being Pimplid, it included "mesonotum transverse-rugosum . . . alae areola nulla" among its characters; his typical and only species, *R. tristis* from Brazil, is black with sparse red marks and the hyaline wings basally infumate. The only other kinds given by Dalla Torre are four brought forward by Cameron from Asia, of which the types of *E. flavobalteata*

(Manch. Mem. 1899, p. 129, ♀) from the Khasi Hills of Assam, of *E. japonica* (Proc. Glasgow Nat. Hist. Soc. 1886, p. 276, ♀) from Hakodate, and three ♀♀ of *E. maculicornis* (Manch. Mem. 1899, p. 132, ♀) from Sikkim in April, 1891 (coll. Bing-ham), Java, by Dr. Horsfield in 1860 (E. India Company) and north Khasi Hills in 1896 (coll. Godwin-Austen), varying in pedal colour and in occasionally having the black segmental apices discally connected by a black longitudinal line, are in the British Museum, though I have not seen his Indian *E. carinifrons* (Manch. Mem., 1899, p. 131, ♀) at all.

TABLE OF ASIATIC SPECIES.

- | | | |
|------|--|--------------------------------|
| (2) | 1. Abdomen and antennae rufescent | 1. <i>carinifrons</i> , Cam. |
| (1) | 2. Abdomen and antennae not at all rufescent. | |
| (16) | 3. Second recurrent subcontinuous with second submarginal nervure. | |
| (11) | 4. Alar apices strongly and determinately infumate. | |
| (8) | 5. Scutellum and abdomen broadly flavous. | |
| (7) | 6. Face and abdominal bands entirely pale | 2. <i>flavopicta</i> , Smith. |
| (6) | 7. Face and pale abdominal bands centrally black | 3. <i>japonica</i> , Cam. |
| (5) | 8. Scutellum and abdomen uniformly black throughout. | |
| (10) | 9. Terebra distinctly longer than body; face all pale. | 4. <i>mülleri</i> , Voll. |
| (9) | 10. Terebra shorter than body; face centrally black. | 5. <i>nigerrima</i> , sp. n. |
| (4) | 11. Alar apices very slightly infumate at apex of radial cell only. | |
| (13) | 12. Sides of segments 3-5 distinctly convex apically; abdomen not strongly compressed. | 6. <i>flavobalteata</i> , Cam. |
| (12) | 13. Sides of segments 3-5 not at all convex; abdomen laterally compressed. | |
| (15) | 14. Abdomen bright flavous, segmental sutures black; nervellus intercepted at its extreme top. | 7. <i>maculicornis</i> , Cam. |
| (14) | 15. Abdomen black, segmental apices bright flavous; nervellus intercepted distinctly before its top. | 8. <i>maculiceps</i> , Cam. |
| (3) | 16. Second recurrent nervure distinctly postfurcal | 9. <i>bimaculata</i> , Cam. |

N.B.—Since 1904, several other species have been described, which are not contained in the British Museum. These are *Epirhyssa ornatipes*, Cam. (Spolia Zeyl. III, 1905, p. 132), a ♂ differing from *E. maculicornis* in having all the femora black-marked, etc.; *E. birói*, ♀ and *E. oceanica*, ♂, described—with *E. tonkinensis* from the Manson Mountains of Tonkin at 2-3,000 feet—by Moesáry (Ann. Mus. Nat. Hung., 1905, p. 16) from German New Guinea; *E. tuberculata*, Cam. (Journ. Str. Br. R. Asiatic Soc., 1906, p. 114, ♂) from Borneo, whence the same author has brought forward *E. curvimaculata*, *E. cruciata* and *E. lineatiscutis* (Ann. Nat. Hist., xx, 1907, pp. 16-18).

1. *Epirhyssa carinifrons*, Cam.

Manch. Mem. 1899, p. 131, ♂.

A black and profusely red and flavous marked species, with the abdomen black-banded and frons longitudinally carinate; length, 11 mm. Khasi Hills, Assam.

2. *Epirhyssa flavopicta*, Smith.

Macrogaster flavo-pictus, Smith, Proc. Linn. Soc. Zool. 1857, p. 121, ♀.

Described from Singapore, of doubtful genus and said to possibly belong to *Rhyssa* (cf. Str. Br. R. Asiatic Soc., 1903, p. 134). Smith's type is doubtless at Oxford; in the British Museum are three ♀♀, one captured at Pulo Penang, by J. C. Bowring in 1861, and two more at Gumong Tahan, Pahang, in the Malay Peninsula between 2,500 and 3,500 feet during May-July, 1905, by H. C. Robinson. I can distinguish neither Cameron's description of *Epirhyssa spilopecta* (Journ. Str. Br. R. As. Soc., 1905, p. 117, ♀; cf. l.c. 1906, p. 115) nor Mocsáry's ♀ *E. fasciata* (Ann. Mus. Nat. Hungr., 1905, p. 16) from this species; they were taken at Kuching in October and in Dutch New Guinea respectively. Smith gives the length at 15 lines and the terebra at double; Mocsáry at only 17 mm., with the terebra 30 mm.; Cameron at 18 mm., with terebra 33 mm.; those I have seen are 20 mm., with terebra (beyond anus) 27 mm. This is doubtless the Javan *Rhyssa* "sans aréole," referred to by Vollenhoven (Tijds. v. Ent., 1873, p. 70).

5. *Epirhyssa nigerrima*, sp. n.

A single ♀ from Borneo was acquired by the British Museum from Stevens in 1857 and might well pass as a melanic form of *E. flavopicta*, with which it agrees in mesonotal sculpture, the alar nervures and apical infumescence; though it differs abundantly from this and every other known species in its totally black body and legs, having nothing but the facial orbits, which coalesce below scrobes, centre of the external orbits obscurely, underside of the front coxae and trochanters, and the front tibiae anteriorly, whitish; the antennae are distinctly shorter than the body, and apically subclavate; the immaculate metathorax and scutellum are both coarsely but not transversely punctate, the three basal segments are conspicuously glabrous and nitidulous, with the following abruptly dull and distinctly punctate on their basal half; the terebra is a little reflexed and the wings (except apically)

entirely hyaline. Length 16 mm.; terebra 20 mm. ♀ only. This was captured by Wallace at Sarawak, and appears to have escaped description by Fred. Smith; it is evidently very closely allied to *Epirhyssa mulleri*, Voll. (Stett. Ent. Zeit., 1879, p. 140), hitherto left in *Rhyssa*, but the legs are all white-lined, the face centrally black and the terebra is much shorter.

6. *Epirhyssa flavobalteata*, Cam.

Manch. Mem. 1899, p. 129, ♀; *E. nigrobalteata*, Cam., Journ. Str. Br. R. Asiatic Soc. 1903, p. 134; cf. Ann. Nat. Hist. xx, 1907, p. 16.

Described from a discoloured Khasian ♀, evidently kept in spirit; and certainly synonymous with the fine bright Bornean ♀, brought forward by the same author under the name *E. nigrobalteata*. Both types are in the British Museum. I have seen another of 22 mm., taken by Dr. Hanitsch at Maxwell's Hill in Perak, during August, 1908, with the abdomen somewhat more broadly black-marked.

8. *Epirhyssa maculiceps*, Cam.

Journ. Str. Br. R. Asiatic Soc. 1905, p. 118, ♀.

The Bornean ♀ type is in the British Museum. If *Rhyssa mesopyrrha*, Mocs. (Ann. Mus. Nat. Hungr., published on 1st June, 1905, p. 6) with "areola distincta nulla," from Java, be synonymous, Cameron's name must fall.

9. *Epirhyssa bimaculata*, Cam.

Journ. Str. Br. R. Asiatic Soc. 1903, p. 135.

This differs from the last species in so slight a degree as to render their distinction doubtful. I can only find that the continuous second recurrent nervure in the former is distinctly a little postfurcal in the latter, that the cubital nervure is straight with the alar apices very slightly infumate in the former, while in the latter it is a little angulated at the ramellus with entirely hyaline wings; the coloration of the thorax differs a little, though that of the abdomen and legs is remarkably similar; and both have the basally strongly sinuate hind tibiae infusate at both extremities.

TABLE OF AMERICAN SPECIES.

- (12) 1. Wings not anteriorly infumate; abdomen broadly pale.
- (9) 2. Abdomen mainly flavous.
- (8) 3. Apical margins of the three basal segments black.

- (7) 4. Hind legs not tricolored.
- (6) 5. Stigma fulvous; alar apices not infumate
 - 1. *speciosa*, Cress.
- (5) 6. Stigma black; alar apices distinctly infumate.
 - 2. *mexicana*, Cress.
- (4) 7. Hind legs distinctly tricolored.
 - 3. *tricoloripes*, Mocs.
- (3) 8. Apical margins of three basal segments clear flavous.
 - 4. *alternata*, Cress.
- (2) 9. Abdomen mainly deep fulvous.
- (11) 10. Segments three to five basally constricted.
 - 5. *amazonica*, Mocs.
- (10) 11. Segments three to five not basally constricted.
 - 6. *histris*, Kriech.
- (1) 12. Wings anteriorly nigrescent; abdomen immaculate
 - 7. *tristis*, Kriech.

2. *Epirhyssa mexicana*, Cress.

Proc. Acad. Philad. 1873, p. 394, ♂.

A single male of this species, in the British Museum, was captured by H. H. Smith at 6,000 feet at Amula in Guerrero during August.

4. *Epirhyssa alternata*, Cress.

Proc. Ent. Soc. Philad. iv, 1865, p. 40, ♂.

I have no hesitation in ascribing a female in the British Museum to Cresson's male description, from which it differs in having the basal fourth or fifth of the otherwise black flagellum bright red with only the basal half of the first two, whereas in the ♂ it is of all, the abdominal segments piceous; further, it is larger, of 15 mm., with the apically subclavate terebra exerted $17\frac{1}{2}$ mm. This example was obtained in Brazil, on the Amazon, by Bates, and acquired in 1862.

7. *Epirhyssa tristis*, Kriech.

Ann. Nat. Hofmus. Wien. 1890, p. 439, ♀.

There can be no doubt, I think, that a large specimen of 26 mm. in the British Museum, with the terebra 35 mm. in length, is referable to Kriechbaumer's Brazilian species, though the head is by no means "pone oculos brevissimum," the temples are well developed, but much narrower than the eyes; the wings, too, "hyalinis, basi, anterioribus margine antico quoque infuscatis," are distinctly infumate with the base nearly to the basal nervure, and the space between the

first recurrent nearly to the second recurrent nervure sub-obliquely flavescent; the whole body is dark ferrugineous, not black. This is a single very old, and perhaps faded, female from "Brazil," purchased about 1835 of Mr. Mornay.

RHYSSA, Grav.

Ichn. Europ. III, 1829, p. 260.

The older authors threw every Pimplid with transrugose mesonotum into the present genus, with the result that there are usually still retained in it many species in reality referable to *Thalessa* and perhaps *Apechoneura*. These it is impossible to relegate to their correct genera without more material than I have found available, though it appears not improbable that all or most of the species from the Malay Region here retained should be placed in the former genus. That the Rhyssides are a very old tribe may be gathered from the fact that Mr. Brues in his "Fossil Hymenoptera from Colorado" (Bull. Amer. Mus. Nat. Hist., xxii., 1908, p. 494) gives an interesting description of his *Rhyssa petiolata*, with its "mesonotum obliquely striated on each side of the median line . . . metathorax areolated . . . areolet apparently open," which would indicate *Epirhyssa* to be the older type; the specimen, which has the fifth segment abnormally large, is a ♀ and was found in the Tertiary strata (cf. Cockerell, Bul. Mus. Comp. Zool. Harvard Coll., 1906, I, No. 2), near Florissant in Colorado. The five palaearctic species of this probably small genus have been well presented by Schmiedeknecht (Opusc. Ichn. 1908, 1144), and need only be mentioned here when occurring outside Europe, where they are mainly found in North America and eastern Asia. *Certonotus* would seem to replace them in Australasia and *Apechoneura* in tropical America.

TABLE OF WESTERN SPECIES.

- | | | |
|-----|--|-------------------------------|
| (8) | 1. Thorax and abdomen profusely white-marked. | |
| (7) | 2. Meso- and meta-sternum not red-marked. | |
| (4) | 3. Flagellum banded, and coxae marked, with white. | |
| | | 1. <i>lineolata</i> , Kirby. |
| (3) | 4. Flagellum not banded: coxae not white-marked. | |
| (6) | 5. All the coxae clear red. | 2. <i>persuasoria</i> , Linn. |
| (5) | 6. All the coxae entirely black. | 3. <i>alaskensis</i> , Ashm. |
| (2) | 7. Meso- and meta-sternum rufescent. | 4. <i>humida</i> , Say. |
| (1) | 8. Orbits, palpi and tegulae alone white. | 5. <i>canadensis</i> , Cress. |

1. *Rhyssa lineolata*, Kirby.

Cryptocentrum lineolatum, W. Kirby, Fauna Bor.-Amer. iv, 1837, p. 260, pl. vi, fig. 1, ♀ [*sic*]; (*nec* Kriech. 1887).

Rhyssa albomaculata, Cresson, Proc. Ent. Soc. Philad. 1864, p. 318, ♀.

This insect sometimes has, as in the type form of Cresson's entirely synonymous *R. albomaculata*, the "areolet minute, petiolated" and cannot, consequently, be referred to *Epirhyssa* as has been done by Dalla Torre, followed by Schmiedeknecht; by the same feature it can hardly be the usually synonymised *E. crevieri*, Prov. (Faun. Ent. Canada, Hym. 449), which is "sans aréole." I have already referred to the type of Kirby's species in the British Museum (Entom., 1909, p. 133, *nota*). It differs from *R. persuasoria* in its pale banded antennae, larger pleural spots, small or obsolete areolet and white-spotted coxae, with the hind ones mainly black; though Provancher (*l.c.*) considered these points too variable to separate them, thus synonymising *R. albomaculata* with Linnaeus' species. In the British Museum are two ♂♂ and four ♀♀, all except the Kirbyan type with strong, though petiolated, areolet; these are from Hudson's Bay in 1844, New York in 1871, Nova Scotia in 1874, and from the Monacknock Mountains in New Hampshire during August, 1906. I possess a female, captured at Clarke City, in Quebec, on 8th June, 1907.

2. *Rhyssa persuasoria*, Linn.

Syst. Nat. 1758, p. 562.

Respecting the occurrence of this palaearctic species in America, we have the explicit statement of Cresson that he possessed both sexes from the Rocky Mountains "precisely identical with European specimens with which I have carefully compared them, both ♂ and ♀" (Proc. Ent. Soc. Philad., 1864, p. 318). It is thus not surprising to find a second species—*Thalessa superba*—common to both continents, though differing slightly in the shape of its pale markings. *R. persuasoria* is evidently uncommon, since Walsh (Trans. Acad. Sc. St. Louis, 1873, p. 109) records it only from the above vague locality and Canada. In Europe it is, on the contrary, very common and most beneficial in destroying the larvae of such Siricidae as *Xeris spectrum*, *Paururus juvencus* and *Sirex gigas*; while Provancher has recorded it—I expect in error—from the longicorn beetles *Monochamus scutellator*, Say and *M. confusor*, Kirby (*cf.* Elliott, Trans. Ent. Soc., 1911, p. 467). There is a long series in the British Museum from Ruthe's

and Bucheker's German and Swiss collections; Tyrol, Lausanne in June (W. H. St. Quentin), France (Lord Walsingham), Pyrenees (Rev. T. A. Marshall); Nova Scotia (Redman), Till Cove in Newfoundland on 30th July, 1874 (John Milne), and a ♂ with unusually complete segmental bands from Georgia (Doubleday). I believe a large female with similar complete bands, from Yesso to the north of Japan, to belong here. I have seen it from Spruce Woods at Deota, Tehri-Gashial in the N. W. Himalayas at an altitude of 7,000 feet, June, 1902. In Britain it is most frequent in the New Forest (cf. *Ichneumonologia Britannica*, iii., 1908, 25, where is given an account of its life history; and Prof. E. Bugnion on "les oeufs pédiculés et la tarière de *Rhyssa persuasoria*" in the *Compte-Rendu des Séances du Sixième Congrès International de Zoologie*, 1905).

3. *Rhyssa alaskensis*, Ashm.

Proc. Washington Acad. Sc. iv, 1902, p. 199, ♀.

The type, in the U. S. Nat. Museum, is alone known; it was captured at Fox Point on July 28th and, there seems little room to doubt, is a mere colour variety of the common Linnæan species. From *R. albomaculata*, Ashmead considered it differed "in shape of the areolet in front wings"!

4. *Rhyssa humida*, Say.

Boston Journ. Nat. Hist. ii, 1836, p. 224, ♀.

W. H. Patton gives an interesting account of this species' economy (Canad. Entom. xi, 1879, p. 15); he took a ♀ of slightly less than half an inch in length in Connecticut on June 6th, 1873, with its terebra firmly driven into the wood of *Betula nigra*, distinctly attempting to oviposit in larvae of the Siricid, *Xiphidria attenuata*, Nort. (Proc. Ent. Soc. Philad., 1862, p. 144). Say described the species from Indiana, "black; feet yellow; thorax with white lines; abdomen with white lateral spots . . . wings immaculate; second cubital cellule petiolated; oviduct at least as long as body . . . Length over half an inch." For a good description we must turn to the long paper by Benj. D. Walsh, M.A., on "Descriptions of North American Hymenoptera" (Trans. Acad. Sc. St. Louis, 1873, pp. 65-166). His proposed genus *Pararhyssa* = *Rhyssa*, Grav. and his *Rhyssa* = *Thalessa*, Holmgr. The ♂ is still unknown.

5. *Rhyssa canadensis*, Cress.

Canad. Entom. 1, 1868, p. 35, ♀.

This female, brought forward in Cresson's "Description of New Canadian Ichneumonidae" (*l.c.* pp. 33-38), will probably prove to be "the analogue" of some palaearctic species with black abdomen. It was taken boring into a pine tree in Quebec, and its genus is confirmed in Walsh's 1873 paper; the areolet is "minute, petiolated, sometimes reduced to a mere point." Provancher did not meet with it (*Faun. Canad. Hym.* 1883, 449).

TABLE OF EASTERN SPECIES.

- | | | |
|------|---|-------------------------------|
| (2) | 1. Thorax and abdomen entirely black; wings hyaline. | |
| | | 1. <i>approximator</i> , Fab. |
| (1) | 2. Thorax or abdomen broadly pale-marked; wings often infumate. | |
| (6) | 3. Wings evenly infumate throughout; thorax all red, abdomen all black. | |
| (5) | 4. Terebra slightly longer than body; hind legs black. | |
| | | 2. <i>lanaria</i> , Voll. |
| (4) | 5. Terebra one-third longer than body; hind legs piceous-red. | |
| | | 3. <i>mirabilis</i> , Smith. |
| (3) | 6. Wings hyaline or irregularly infumate; abdomen not immaculate black. | |
| (10) | 7. Body entirely fulvous; eyes and alar fasciae alone black. | |
| (9) | 8. Antennae and hind tarsi fulvous. | 4. <i>fulva</i> , Voll. |
| (8) | 9. Antennae and hind tarsi entirely black. | 5. <i>fasciata</i> , Smith. |
| (7) | 10. Body not or sparsely fulvous, mainly black with flavous markings. | |
| (14) | 11. Wings distinctly infumate towards their apices. | |
| (13) | 12. Wings subquadrately nigrescent beyond stigma; length 13 mm. | 6. <i>varilineata</i> , Cam. |
| (12) | 13. Wings but subinfumate apically; length 38 mm. | |
| | | 7. <i>fulvipennis</i> , Cam. |
| (11) | 14. Wings entirely immaculate. | |
| (16) | 15. Third and following segments apically flavous; length 18 mm. | 8. <i>claripennis</i> , Cam. |
| (15) | 16. Fourth and fifth segments laterally citrinous; length 25 mm. | |
| | | 9. <i>mesopyrrha</i> , Mocs. |

N.B.—In all probability the majority of the species here tabulated should be placed under *Thalessa*, excepting those of Fabricius and Mocsáry. One can instate nowhere Brullé's unlocalised *Rhyssa marginalis* (*Nat. Hist. Hym.*, iv., 1846, p. 79, ♀) with broken antennae and legs, nor Vollenhoven's *R. bernsteini* (*Stett. Ent. Zeit.*, xl, 1879, p. 138, ♀), which was described from a spirit specimen in the Leyden Museum, of which the exact locality was lost, but it was thought to be either the Isle of Salwatti or of Waigiou.

1. *Rhyssa approximator*, Fab.

Ent. Syst. II, 1793, p. 162, ♂.

This species extends from Sweden across the Alps to Hungary, but is rare, and said by Holmgren to prey upon the Siricid, *Xiphydria dromedarius*, Fab. A single large ♀ of 20 mm., with the characteristic canaliculation of the two basal segments, belonging to Kriechbaumer's var. *ruficoxis* (Ent. Nachr. xiii, 1887, p. 250 et xv, 1889, p. 318) is in the British Museum, from as far east as Samarowa in Siberia. Superficially it is not unlike *Ephialtes manifestator*, L., for which Fred. Smith mistook it.

2. *Rhyssa lanaria*, Voll.

Tijds. v. Ent. 1873, p. 68, ♀.

Remarkable for its entirely orange-red head, thorax and anterior legs, black abdomen and hind legs, and the evenly infumate wings; length 22 mm. "Dans l'île d'Amboine; probablement elle se retrouvera dans les autres îles Moluques," but apparently not yet found there. It is similar to *R. mirabilis*, but too distinct to be considered a variety of it.

3. *Rhyssa mirabilis*, Smith.

Proc. Linn. Soc. Zool. II, 1857, p. 120, ♀.

Very closely allied to the last species. The type was found by Wallace at Sarawak and is in the Oxford University Museum.

4. *Rhyssa fulva*, Voll.

Stett. Ent. Zeit. XL, 1879, p. 136, ♂.

Glabrous, nitidulous and fulvous with the head paler, eyes and a transverse alar fascia infusate; length, 2 cm. (= 20 mm.). It is said to be most similar to *R. fasciata*, but to differ in having the antennae and hind tarsi flavidous-red, while in that species they are black. Both are probably referable to *Thalessa*. It was described from a single male found on the Isle of Obi in the Moluccas.

5. *Rhyssa fasciata*, Smith.

Proc. Linn. Soc. Zool. IV, 1869, Suppl. p. 140, ♂; *Rhyssa fulva*, Cam.
Proc. Zool. Soc. 1901, p. 229, ♂ (nec Voll. 1879).

This name is instanced (*l.c.*) by Smith for his *R. maculipennis* (*lib. cit.* iii, 1858, p. 173, nec 1857). It is a rufescent-flavous

species with antennae and vertex black, and the hyaline wings with a nigrescent plaga; length, 19 mm. It was taken by Wallace at Aru in the Malay Archipelago. *R. fulva* Cam. is obviously the same species, collected in New Britain by Dr. A. Willey, probably at New Pomerania.

6. *Rhyssa variilineata*, Cam.

R. variilineata, Cam. Ann. Nat. Hist. xx, 1907, p. 15, ♀.

The smallest Malay species known to its author and doubtless a *Thalessa*, since he says it differs in "the much larger alar cloud, which extends beyond the cubitus, and by the metanotum having three separated yellow spots on the apex, the rest being black." It occurred at Kuching in September.

7. *Rhyssa fulvipennis*, Cam.

Manch. Mem. 1899, p. 127, ♀.

The only known Indian species excepting *R. persuasoria*, of which I have seen the two females referred to above, and at once known by its great size of 38 mm., with the terebra nearly double that of the body; the wings are deeply fulvescent-hyaline, with their apices only subinfumate; the antennae, too, are fulvous with their centre subflavescent. The type, at Oxford, was collected by Rothney in the Khasi Hills of Assam.

8. *Rhyssa claripennis*, Cam.

Ann. Nat. Hist. xx, 1907, p. 15, ♀

Taken at Kuching by Hewitt in November; of 18 mm. with the terebra 21 mm.; and it "may be known from the described Indo-Malay and Indian species by the immaculate wings" says its author, who also described *R. nigratarsis* of 1902 (*nec* 1886) with immaculate wings.

9. *Rhyssa mesopyrrha*, Mocs.

Ann. Mus. Hist. Nat. Hungr. xx, 1907, p. 15, ♀

Apparently intermediate between the present genus and *Epirhyssa*—especially *E. maculiceps*, Cam., *q.v.*—since in the Javan female the "areola distincta nulla est," while in the Bornean it is "haud magna triangulari." Mocsáry's paper (*loc. cit.*) "*Rhyssae Sociarumque species in collectione Musei Nationalis Hungarici ab A. Mocsary recensite*," is worthy of especial notice.

TABLE OF NEW ZEALAND SPECIES.

- (2) 1. Smaller; second segment laterally immaculate . . .
1. *fractinervis*, Voll.
(1) 2. Larger; second segment with distinct lateral spots.
2. *clavula*, Colenso.

1. *Rhyssa fractinervis*, Voll.

Tijds. v. Ent. 1873, p. 67, pl. iv, fig. 1, ♀; *R. antipodum*, Smith, Tr.
Ent. Soc. 1876, p. 479, pl. iv, fig. 1, ♀.

Both figures are remarkably good and the synonymy indubitable. Vollenhoven says it inhabits "les environs d'Auckland dans la Nouvelle Zeelande" and Smith knew "two specimens from the North Island, and one taken on a black birch-tree at Oxford, near Christchurch," New Zealand. In the British Museum is Smith's type, so labelled by himself, with a second ♀ from New Zealand ex coll. Cameron, though not mentioned by him at Manch. Mem. 1898, No. 1, p. 26. The four subquadrate discal abdominal spots are very characteristic of both this and the next species.

2. *Rhyssa clavula*, Colenso.

Trans. New Zealand Institute, xvii, 1885, p. 158, ♀.

Much larger than the last (and only other) New Zealand species, the type of which is but 30 mm. in length, with the terebra 45 mm. Colenso says: "Its very peculiarly shaped end of the abdomen and lateral spots on its second segment, dark colour of its femora and posterior tibiae, etc., striped clypeus, yellow margins of the basal joints of antennae, iridescent and hairy and dusky-coloured—infumated, hairy at bases—wings, 3 ocelli, etc., have caused me" to consider it distinct. It is, however, probably nothing but an unusually large ♀, with a length of 38 mm. and terebra of 65 mm., though the terebra is much longer in proportion. It was taken in "high and dense forests near Norsewood, Waipawa County; April, 1884."

THALESSA, Holmgren.

Oefv. K. Vet. Acad. xvi, 1859, p. 122; *Megarhyssa*, Ashm. Canad. Entom. xxxii, 1900, p. 368.

WESTERN SPECIES.

1. *Thalessa atrata*, Fab.

Ichneumon atratus, Fab. Spp. Ins. I, 1781, p. 436, ♀.

“*Ichneumon ater*, capite pedibus strigaeque anali flavis, aculeo longissimo. Habitat in America boreali.” With some added

details, Fabricius leaves no doubt that the species sexually termed *Rhyssa atrata* and *R. laevigata*, passably figured by Brullé (Hist. Nat. Hym. iv, 1846, pl. xl, et pp. 77, 78) belongs here; the latter vaguely records both from "l'Amerique septentrionale," as well as the ♀ from Guadeloupe. Provancher gives a simple but sufficiently explicit table (Faun, Entom. Canad. Hym. 1883, p. 445) of the four north American species thus:—

Colour black.

Antennae flavous 1. *atrata*.

Antennae black 2. *nitida*.

Colour yellow and rufescent.

Wings without dark marks 3. *superba*.

Wings brown-marked 4. *lunator*.

Harrington tells us (Canad. Entom. 1882, p. 82) that the present species varies in size from $1\frac{1}{4}$ inches to nearly two, with a wing expansion of $2-2\frac{3}{4}$ inches and terebra 4 to $5\frac{1}{2}$ inches in length. It is much rarer in Canada than *T. lunator*. He saw a ♀ with her terebra embedded four and a half inches into beech and adds that it occurs in the latter part of the summer. At a meeting of the Exeter Naturalists' Club, D'Urban remarks that a *Rhyssa*, which he terms *necator*, is common near Montreal, adding that "in many trees" the broken ovipositor might be seen embedded in the solid wood. In the British Museum are nine examples from New York (H. Edwards, 1884), Albany on 23rd June, 1901 (Marshall), Florida (Crowley, 1901), Orilla in western Canada in 1852 (Stevens), and the United States ex coll. Prof. Riley (Rev. T. A. Marshall). The Buda-Pesth Museum has a couple of ♀♀ from Illinois and Missouri.

2. *Thalessa nitida*, Cress.

Rhyssa nitida, Cress. Proc. Ent. Soc. Philad. iii, 1864, p. 319, ♂.

Relegated to *Thalessa* by its author (Trans. Acad. Sc. St. Louis, 1873, p. 109).

3. *Thalessa superba*, Schrank.

Ichneumon superba, Schr. En. Ins. Austr. 1781, p. 350, ♀; *Pimpla clavata*, Fab. Piez. 1804, p. 118, ♀; *Rhyssa nortoni*, Cress. Proc. Ent. Soc. Philad. 1864, p. 317, ♀; *Rhyssa quebecensis*, Prov. Nat. Canad. v, 1873, p. 447, ♂♀.

First recorded in America from the Rocky Mountains, Colorado Territory and dedicated to Edward Norton. The

♂ was first noticed by Provancher (Nat. Canad. 1880, p. 13) and in his Faun. Ent. Canad. 1883, p. 445, since when we have heard nothing of it; he differentiates it from *T. lunator* in the lateral segmental flavous marks being circular in place of "en chevrons," in the immaculate wings, etc. Mocsáry knew a single pair from California; but the British Museum has the following good series, including a single European ♀, ex coll. Bucheker, taken on 2nd October at "Cap." probably in Switzerland; it has been bred from the Siricid, *Tremex fuscicornis*. The American ♀♀ are from the Monacknock Mountains of New Hampshire in 1911 (Hon. W. Rothschild), Hudson's Bay in 1844 (Geo. Barnston), from Farren White's collection; and from Vernon in British Columbia on 9th August, 1903 (Miss Ricardo), this is a dark specimen with all the coxae and part of femora and most of the thorax black, with the lateral marks on the fourth and fifth segments elongate, showing a transition form. The ♂♂ are from Boston in Massachusetts and New York (H. Edwards), United States in 1843 (E. Doubleday) and New York. I have ventured to synonymise *T. nortoni* with Schrank's palaearctic species, since I have been unable to find anything approaching specific distinction between them, the only divergence rests in the shape of the lateral segmental pale markings. An intermediate form appears to be Provancher's *Rhyssa quebecensis*, which its author separated mainly on the strength of the "taches jaunes des côtes de l'abdomen qui sont circulaires au lieu d'être en chevrons"; there is nothing to differentiate it from more typical *T. superba*, and Provancher himself remarks in 1883—*cf. supra*—that there had been only "4 espèces rencontrés" in Canada.

4. *Thalessa lunator*, Fab.

Ichneumon lunator, Fab. Spp. Ins. i, 1781, p. 430.

Distinctly the commonest nearctic species; North America and Guadeloupe (Brullé), Texas (Cresson), Canada (Provancher), Missouri and Kentucky (Mocsáry), numerous specimens flying round a hickory log in south Illinois, early in July (Walsh). Harrington adds (Canad. Entom. xix, p. 206), in "The Nuptials of *Thalessa*," that they oviposited in *Tremex columba* larvae in rotten maples on 7th June, 1887, and that copulation took place with four different males, lasting two and a half minutes with the last and, on another occasion, one and a half minutes. In the British Museum are numerous examples of both sexes taken at New York in 1844 by E. Doubleday, and in both 1884 and 1889 by H. Edwards;

at Albany on 17th July, 1900, by Rev. T. A. Marshall; at Orilla in western Canada (Stevens); at Boston in Massachusetts; and three ♀♀ in 59th Street, Chicago, on a dead tree on 10th August, 1897, by Prof. Poulton. The size is said by Walsh (Trans. Acad. Sc. St. Louis, 1873, p. 108) to sometimes double that of others; the terebra, he adds, is only one-sixth longer than the body, while Brullé gives it at nearly double its length.

TABLE OF EASTERN SPECIES.

- | | | |
|------|---|---------------------------------|
| (10) | 1. Wings infumate or deeply black-fasciated before their apices. | |
| (3) | 2. Mesonotum with two nigrescent vittae | 1. <i>japonica</i> , Ashm. |
| (2) | 3. Mesonotum with no, or but pale, mesonotal vittae. | |
| (5) | 4. Body rust-red with metathorax not at all sulcate. | |
| | | 2. <i>superbiens</i> , sp. n. |
| (4) | 5. Body not entirely rust-red or metathorax sulcate. | |
| (7) | 6. Subapical alar fascia narrow and extending half in ♂, or entirely in ♀, across wing. | 3. <i>instigator</i> , Smith. |
| (6) | 7. Subapical fascia not narrow, hardly extending beyond areolet. | |
| (9) | 8. Antennae broadly white-banded. | 4. <i>nobilitator</i> , Smith. |
| (8) | 9. Antennae not at all white-banded. | 5. <i>maculipennis</i> , Smith. |
| (1) | 10. Wings hyaline or flavescent throughout. | 6. <i>nigritarsis</i> , Cam. |

1. *Thalessa japonica*, Ashm.

Proc. U.S. Nat. Museum xxx, 1906, p. 176, ♀.

T. japonica, as its author remarks, "shows some affinity with *Megarhyssa superba*," though the bivittate mesonotum and black-semifasciate wings are distinctive. It has not been mentioned since first described from Sapporo in Japan. In the British Museum is another female also from Japan, taken in 1862 by R. Fortune. It is doubtless this Japanese species that is referred to by Vollenhoven (Tijds. v. Ent. 1873, p. 70).

2. *Thalessa superbiens*, sp. n.

A pale ferrugineous insect, doubtless no more than a geographical form intermediate between *T. superba* of Europe, from which it differs in having the wings semifasciate like those of *T. japonica*, and *T. lunator* of Canada, with which it agrees in the wing-fasciae, while having the abdominal spots of *T. superba*. Possibly both this and *T. japonica* are forms of *T. superba*, but Ashmead's species is black with the fasciae concolorous and the punctate metathorax centrally sulcate; here the body is rust-red with the fasciae smoky and the

glabrous, strongly nitidulous metathorax not at all sulcate, the head is posteriorly broader and the face immaculate; length, 20-42 mm. ♀ only. There are seven examples in the British Museum, of which the type was captured in 1877 at Shanghai by W. B. Pryer; the largest and smallest examples were secured in northern China in 1859 by R. Fortune; two more were captured at Shanghai and Hai-ning, both during October, 1892, by J. J. Walker; and the last two females, in which the alar fasciae are distinctly fainter, came from Tokio in Japan in 1881.

3. *Thalessa instigator*, Smith.

Rhyssa instigator, Smith, Proc. Linn. Soc. Zool. viii, 1864, p. 65, ♀;
Rhyssa doreica, Voll. Tijds. v. Ent. xvi, 1873, p. 69, pl. iv, fig. 3, ♀;
Rhyssa tridentata, Cam. Proc. Zool. Soc. 1901, p. 230.

Described, like all his others of this group, as a *Rhyssa* by Smith from New Guinea, but relegated to this genus by Tosquinet, who gave a detailed account of it (Mém. Soc. Ent. Belg. 1903, p. 97, ♀) from the same somewhat broad locality; though Mocsáry is more explicit in ascribing both sexes, brought forward by him (Ann. Mus. Hist. Nat. Hungr. 1905, p. 3) to Bongu and Sattelberg on the Huon Gulf to the east of the island, where Biró took two pairs. Mocsáry here synonymises *Rhyssa doreica*, Voll., the type of which came from Dorey in New Guinea; and I cannot entertain the least doubt that *Rhyssa tridentata*, Cam., from New Britain, is nothing but a small ♀ of the same species. I believe Smith himself described the ♂ from Mysol, under the name *R. viator* (Proc. Linn. Soc., Zool., 1863, p. 10), since in the British Museum is a single ♂, received in 1862 and captured by Wallace in New Guinea. In coloration it is of the same rich chocolate brown as the ♀, with all the flavous marks analogous with the addition of the whole prothorax, cheeks, clypeus and disc of hind coxae concolorous; the abdomen is immaculate chocolate with the segmental apices and sides slightly rufescent, and basal segment convex; the hind femora are nigrescent and a determinate infumate fascia runs, unlike that of the ♀, only from the apex of the stigma to that of the areolet.

4. *Thalessa nobilitator*, Smith.

Proc. Linn. Soc. Zool. vi, 1862, p. 63, ♂ ♀.

Dalla Torre's reference, copied by Prof. Dr. Schmiedeknecht, is incorrect. Both sexes are described by Smith; the ♀ is so like an unusually profusely marked *T. maculipennis* that

I should have leaned towards their synonymy were it not that the antennae are pale-banded beyond their centre and the mesonotum discally rufescent; in sculpture, venation and segmental emargination they exactly agree. One female in the British Museum was taken by Wallace at Menado in Celebes and is labelled as a co-type by Smith; the adjacent Tondano is the typical locality.

5. *Thalessa maculipennis*, Smith.

Proc. Linn. Soc. Zool. 1857, p. 120, ♀.

Probably not a rare species; originally recorded from Sarawak and Singapore; it is said (Journ. Str. Br. R. As. Soc., 1903, p. 134) to vary in size from 20 to 27 mm., and to have been taken at Kuching. There are three females thence in the British Museum, of which one was taken at Gunong Tahan in 1905, along with *Epirhyssa flavopicta*, by H. C. Robinson. The quite black subapical alar spot renders this species very distinct, though I anticipate that the next one will prove to be its male.

6. *Thalessa nigritarsis*, Cam.

Rhyssa nigritarsis, Cam. Journ. Str. Br. R. Asiatic Soc. xxxvii, 1902, p. 45, ♂ (nec 1886); *Megarhyssa variegata*, Mocs., Ann. Mus. Nat. Hist. Hung. 1905, p. 2.

This Bornean species would need renaming (were not *Rhyssa nigritarsis*, Cam. Biol. Centr.-Amer., 1886, p. 260, an *Apechoneura*), if found distinct from the last species, which I consider improbable in spite of its immaculate wings and other discrepancies. One of Cameron's co-types is in the British Museum, taken at Kuching on 4th May, 1900; when this was received in 1903, with a second from Borneo, the type was said to be in the author's collection; two more were taken at Kuching, also by Shelford, one on 21st January, 1902. The length is given at 17 mm.; it varies from 15 to 19 mm. Mocsáry's excellent description of his two ♂♂ *Megarhyssa variegata* from Perak, *l.c.*, leaves no doubt that it is synonymous with the present species.

The number of specimens and species of this and the preceding genus which were captured by A. R. Wallace in the Malay Region appears remarkable until we realise his indefatigable energy in this direction. Excluding all those appertaining to the most popular Orders, the Lepidoptera and Coleoptera, he tells us in *The Malay Archipelago*, 1869, Vol. i, p. xiv, that he brought home 13,400 specimens of Malay insects.

LYTARMES, Cameron.

Manch. Mem. 1899, p. 144.

This genus is so badly diagnosed by its author that it is very difficult to seize the most constant points of distinction from other Rhyssides; he himself says (*loc. cit.*) that it "has the striated mesonotum of *Rhyssa*, but differs from it in the appendiculated areolet"—*cf. R. lineolata*, Kirby—"and the abdominal segments being not distinctly longer than their breadth"—*cf. him* under *Epirhyssa*, *supra*—"in the shorter hinder tarsi compared with the tibiae, in the much shorter hinder coxae, and in the head being less developed behind the eyes." The last statement has been converted by Ashmead in 1900 into "temples hardly half the width of the eye" and copied by Schmiedeknecht in *Gen. Insect.*; but it is an exaggeration. As a matter of fact the two following species cannot be confused with any other Rhyssides, since they are so slender as to be more liable to be mistaken for *Poemenia*, Holmgr. Only two species, from India, are known.

TABLE OF SPECIES.

- | | |
|------|---|
| (2). | 1. Wings infumate below stigma; mesonotum not flavous. |
| | 1. <i>maculipennis</i> , Cam. |
| (1) | 2. Wings hyaline; mesonotum with discal flavous vittae. |
| | 2. <i>hyalinipennis</i> , Cam. |

1. *Lytarmes maculipennis*, Cam.

Manch. Mem. 1899, p. 145, pl. iii, fig. 9, ♀.

A black species with brown markings and the legs paler, the head white-marked, and the wings infumate below the stigma; length, 16 mm. The figure shows the head to be posteriorly as broad as the eyes (Cameron evidently referred to its thickness, not its breadth) and the spurious nervure of hind wing to be emitted from the junction of nervellus and median nervure. The type was taken by Rothney in the Khasi Hills of Assam, and is in the Oxford Museum.

2. *Lytarmes hyalinipennis*, Cam.

Manch. Mem. 1899, p. 146, ♂.

A single pair of this much more brightly marked species, in the Calcutta Museum, captured by W. Doherty in Tenasserim, has passed through my hands; both sexes agree with Cameron's somewhat superficial description in every respect, with the exception of the relative length of the basal radial

abscissa and areolar petiole, which is not more than one-fourth or -fifth of the former's length; the scutellum is peculiarly broad and dull, the metanotum polished and strongly nitidulous with its spiracles elongate and impressed; the abdomen is sublinear and shining with the third and fourth segments strongly emarginate apically; the hind tibiae are unusually stout, basally nigrescent and the front ones are basally constricted. It is strange that two so closely allied species should at first have been described only in the opposite sex. The typical male is from Assam.

APECHONEURA, Kriech.

Ann. Nat. Hist. Hofmus. Wien. 1890, p. 485.

This is a most interesting tropical American genus, at once known from other of the Rhyssides by its entire areolet, metanotal areae and strongly carinate frons; it has the very unusual character of a frequently white-banded, sometimes twice banded, terebra and the species are peculiarly graceful in outline. It appears to have been quite unknown to the north American writers and, excepting one species somewhat inadequately diagnosed by Brullé, remained undiscovered till so late as 1886, when two were brought forward under the genus *Rhyssa* from Nicaragua and Panama; since that time Kriechbaumer and Mocsáry have given us nearly a dozen species, in some of which the neuration of the hind wing is unique among Ichneumonidae.

TABLE OF SPECIES.

- | | | |
|------|--|-------------------------------|
| (4) | 1. Flavo-testaceous with only antennae, terebra and tarsi black. | (PARANEURA, sub-gen. nov.) |
| (3) | 2. Hind coxae not dentate below; metapleurae apically mutic; abdomen flavous-marked. | 1. <i>rufata</i> , Mocs. |
| (2) | 3. Hind coxae triangularly dentate below; metapleurae dentate; abdomen immaculate. | 2. <i>nigricornis</i> , Mocs. |
| (1) | 4. Thorax or abdomen mainly black, often white-marked. | (APECHONEURA, Kriech.). |
| (6) | 5. Mesonotum produced, triangularly dentate laterally. | 3. <i>foveata</i> , Mocs. |
| (5) | 6. Mesonotum not or but slightly produced on either side. | |
| (10) | 7. Legs, and often abdomen, nearly entirely red. | |
| (9) | 8. Abdomen red, with only a discal line black. | 4. <i>nigritarsis</i> , Cam. |
| (8) | 9. Abdomen black and flavous, not at all red. | 5. <i>carinifrons</i> , Cam. |
| (7) | 10. Hind legs and abdomen not at all red-marked. | |
| (14) | 11. Thorax, head and anterior legs entirely bright red. | |

- (13) 12. Metapleurae dentately produced above hind coxae; abdomen entirely black; areolet petiolate. 6. *nigriventris*, Mocs.
- (12) 13. Metapleurae not produced; abdomen white-marked; areolet sessile. 7. *pictiventris*, Mocs.
- (11) 14. Black with stramineous markings, not at all red.
- (16) 15. Abdomen not laterally pale-marked; terebra immaculate black. 8. *semilunata*, Mocs.
- (15) 16. Abdomen laterally pale-marked; terebra white-banded.
- (24) 17. Spurious nervure emitted from median as far from nervellus as latter is long.
- (23) 18. Terebra more than double the length of the body.
- (20) 19. Segments 3-5 obliquely pale-marked laterally; areolet normal. 9. *longicauda*, Kriech.
- (19) 20. Segments 1-5 apically pale throughout; areolet apically produced.
- (22) 21. Connation of ramus with median as long as nervellus; terebra uniannulate. 10. *major*, sp. n.
- (21) 22. Connation of ramus four times length of nervellus; terebra bisannulate. 11. *minor*, sp. n.
- (18) 23. Terebra about as long as the body. 12. *brevicauda*, Kriech.
- (17) 24. Spurious nervure emitted almost from top of nervellus. 13. *terminalis*, Brullé.

SUB-GEN. *Paraneura*.

1 et 2. *Apechoneura rufata* et *A. nigricornis*, Mocs.

Ann. Mus. Nat. Hungr. 1905, p. 11.

A single female of the former from Brazil, with three ♀♀ of the latter thence and from Costa Rica, are the only examples known. These appear so distinct from the remainder of the genus as to be worthy of a subgeneric name.

SUB-GEN. *Apechoneura*, s. str.

3. *Apechoneura foveata*, Mocs.

Ann. Mus. Nat. Hungr. 1905, p. 14.

The only known female is said to be allied to *Rhyssa nigratarsis*, Cam., 1886, but with the pro- and meso-thorax laterally triangularly dilated and dentately produced. It was taken in Costa Rica.

4. *Apechoneura nigratarsis*, Cam.

Rhyssa nigratarsis, Biol. Centr. Amer. 1886, p. 260, pl. xi, fig. 3, ♀ (nec 1902).

The type and a co-type of this fine species are in the British Museum. It is a true member of the present genus.

5. *Apechoneura carinifrons*, Cam.

Biol. Centr. Amer. 1886, p. 261, ♂ ♀.

Both the single male and female referred to by Cameron are in the British Museum, and the former is quite certainly correctly associated here, as was surmised by Mocsáry in 1905. No further details of capture, than the localities Chontales in Nicaragua, and Panama, are forthcoming.

6. *Apechoneura nigriventris*, Mocs.

Ann. Mus. Nat. Hist. Hungr. 1905, p. 12: Schm. Gen. Insect. 1907, pl. ii, fig. 11 [19, *sic*], ♀.

Described from a single ♀ from Pebas on the Amazon in Peru. One in the British Museum was taken by Bates in Brazil also on the Amazon, and acquired in 1862; in this example the body is 18 mm. in length and the terebra but 17 mm. Mocsáry says the areolet is sessile; Schmiedeknecht figures it strongly petiolate; in our female the sides are just coalescent above.

7. *Apechoneura pictiventris*, Mocs. *l.c.*

So like the last species that it was not till I examined the metapleuræ that I appreciated its distinction. In the present insect these are not at all produced above the hind coxæ and, whereas in the former they extend as far as the metathoracic apex, here they are extremely obtuse and very short; further, the basal segment is more deplanate and less parallel-sided, the spiracles of the three basal segments are much less conspicuous, the two basal are white only on their disc and the 3rd to 5th have a short lateral white streak, with the whole epicnemial concolorous, terebra longer, areolet broadly sessile and the nervellus no shorter than the connation of its ramus with the median nervure; length 16-20 mm., terebra 32-34 mm. ♀ only. A single specimen, captured by Bates at Ega on the Amazon, was acquired by the British Museum in 1856; the type was from Iquitos on the Amazon in Peru.

8. *Apechoneura semilunata*, Mocs.

Ann. Mus. Nat. Hungr. 1905, p. 10.

The single ♀ known, from Corioco in Bolivia, is black with flavous and whitish markings; antennæ with joints 16-18 and 33-41 flavescent-white; head broadly white; thorax with scutellum and other markings whitish; hind legs black with tibial base and second to fourth tarsal joints white;

abdomen with the five first dorsal segments apically semilunate flavescent-white, the sixth immaculate black and seventh apically white; terebral valvulae black, not pale-banded; length 20, terebra 55, mm. Similar to *A. longicauda*, but with 3rd to 5th segmental marks discally semilunate and not lateral, and terebra immaculate. Mocsáry hardly appears to have appreciated the value of the nervellus structure, since he nowhere refers to it.

9. *Apechoneura longicauda*, Kriech.

Ann. Nat. Hofmus. Wien. 1890, p. 486, ♀.

Extremely like *A. terminalis* and only to be distinguished by the peculiarly short connation of the ramus with the median nervure of the hind wing; this is hardly longer than in some *Echthromorpha* species. Its author assigns it bisannulated antennae, but this feature also sometimes occurs in the former species, nor do I consider the larger size of the latter to be at all constant; in both the terebra is about twice-and-a-half the length of the body. One ♀ "Coary Amazonas Braziliae" (Kriech.); four ♀♀ from Pebas and Chanchomayo in Peru (Mocsáry); and one in the British Museum, received in the Crowley Bequest, labelled "Bogota."

10. *Apechoneura major*, sp. n.

Not unlike a large *A. longicauda*, but with the pale apices of the segments entirely transverse and not at all oblique as in that species, the apices being only and entirely pale stramineous, and the areolet is apically much more strongly produced externally. Its length is 28 mm., with the terebra 74 mm. Kriechbaumer tells us that *A. terminalis* extends to 30 mm., but the hind wing ramus is quite narrowly connate, while here its connation is as long as is the nervellus. ♀ only. The type was presented to the British Museum, from Ecuador in 1872, by Clarence Buckley.

11. *Apechoneura minor*, sp. n.

An interesting little species with the abdominal markings of *A. major*, i.e. the apices of all the segments evenly pale throughout, but the head is much broader behind the eyes, the legs more slender, the size but one third, and the terebra both centrally and apically annulated with white. It is instantly known from all other species of the present genus—or of the whole Ichneumonidae, to the best of my knowledge

—by the spurious nervure of the hind wing being connate with the median for four times the length of the nervellus. Length, 10 mm.; terebra, 20 mm. ♀ only. The type was captured by H. W. Bates on the Amazon in Brazil, and acquired by the British Museum in 1862.

12. *Apechoneura brevicauda*, Kriech.

Ann. Nat. Hofmus. Wien. 1890, p. 487, ♀.

Known by the brevity of the terebra, which is not or hardly longer than the body, and by the elongate connation of the hind wing ramus, which is very distinctly longer than the nervellus. Kriechbaumer says the body is 13 and the terebra 14 mm. in length; his single ♀ is from "Coary Amazonas Braziliae." Two ♀♀ taken by H. W. Bates at Ega on the Amazon, now in the British Museum, agree perfectly, with the two exceptions of the length (body and terebra both 20 mm.) and the terebra broadly white-banded before its centre, as well as apically; an analogous female from British Guiana is in my own collection. I can hardly credit that Mocsáry's two ♀♀ from Manaos and Fonteboa belong here, since he gives them so long a terebra: one with body 17 and terebra 25 mm., the other with body 18 and terebra 30 mm.

13. *Apechoneura terminalis*, Brullé.

Rhyssa terminalis, Brullé, Hist. Nat. Hym. iv, 1846, 80, ♀.

Brullé leaves one to consider the abdomen flavous beneath, but there can be no doubt that Kriechbaumer's description (Ann. Hofmus. Wien. 1890, p. 486) is of the ♀ of the same species. I consider it distinct from *A. longicauda* solely on the character of the nervellus: the connate part of the ramus with the median nervure is as long as the first recurrent nervure. One Chilian and five Brazilian specimens are known, of which the last two were recorded by Mocsáry from Minas Geraes; and there is another in the British Museum from "Brazil," ex. coll. Mornay about 1835.

CERTONOTUS, Kriech.

Entom. Nachr. xv, 1889, p. 308.

This genus was erected by Kriechbaumer for the reception of a single species from Australia, which alone figures in Dalla Torre's Catalogue. It was almost immediately taken in hand by Dr. R. Krieger (Zeits. Hym.-Dip. 1901, pp. 113-126), who finds *Rhyssa flaviceps*, Voll., to belong here and describes four

new kinds, all from the Austro-Malay region. Mocsáry in 1905 synonymises one of these with a name by Smith in 1854, and brings forward one new kind; Tosquinet, who did not recognise the genus, brought forward another in 1903. Cameron has later in 1907 instanced a further one. There are in Victoria and Tasmania one or two other genera, so closely allied to the present one that they are to be distinguished only by their quite smooth, or but finely transaciculate, mesonotum; and these appear to form a natural link between the *Ephialtes*-group of the Pimplinae and the Rhyssides, from which they are excluded by their lack of distinct and strong mesonotal transcarinae.

TABLE OF SPECIES.

- (14) 1. Basal metanotal area wanting; basal third of hind tibia with fovea; basal lateral angles of pronotum simple.
- (13) 2. Areolet triangular, emitting recurrent beyond centre; thorax mainly black.
- (12) 3. Wings subhyaline, not at all infumate.
- (9) 4. Metanotum basally black; second recurrent strongly geniculate, emitted near apex of areolet.
- (6) 5. Hind coxae subdentate below; pleurae immaculate; segments apically pale throughout. 1. *geniculatus*, sp. n.
- (5) 6. Hind coxae obtusely produced below; pleurae pale-marked; segments often only laterally pale.
- (8) 7. Antennae not white-marked; hind tibiae unifoveate; segments laterally pale. 2. *vestigator*, Smith.
- (7) 8. Antennae broadly white; hind tibiae with a series of foveae; segments apically pale. 3. *nitidulus*, sp. n.
- (4) 9. Metanotum basally flavous; second recurrent slightly geniculate, emitted near centre of areolet.
- (11) 10. Mesonotum mainly black; metathorax short and convex. 4. *monticola*, sp. n.
- (10) 11. Mesonotum mainly red; metathorax neither short nor convex. 5. *rufus*, Mocs.
- (3) 12. Wings violaceous and distinctly infumate. 6. *labialis*, Cam.
- (2) 13. Areolet subquadrate, emitting recurrent from centre; thorax entirely red. 7. *seminiger*, Krieg.
- (1) 14. Basal metanotal area entire; apical third of hind tibia with spine; basal lateral angles of pronotum produced.
- (20) 15. Body entirely rufescent throughout.
- (17) 16. Flagellum entirely black; posterior metathoracic transcarina wanting; scutellum convex. 8. *rufescens*, sp. n.
- (16) 17. Flagellum broadly white towards apex; posterior transcarina distinct; scutellum deplanate.
- (19) 18. Scutellum transcarinate; areolet subsessile; antennal apices white. 9. *annulatus*, sp. n.

- (18) 19. Scutellum simple; areolet distinctly petiolate; apical flagellar joint black. 10. *apicalis*, sp. n.
- (15) 20. Body mainly black, pale-marked.
- (28) 21. Scutellum white or flavidous.
- (25) 22. Face finely punctate; mesonotum intermittently granulate-carinate.
- (24) 23. Thorax flavous, with mesonotum centrally black. 11. *humeralifer*, Krieg.
- (23) 24. Thorax black, with mesonotum centrally flavous. 12. *flaviceps*, Voll.
- (22) 25. Face coarsely punctate, centrally smooth; mesonotum evenly transcarinate.
- (27) 26. Nervellus entire, not intercepted; flagellum apically white. 13. *hinnuleus*, Krieg.
- (26) 27. Nervellus geniculate and intercepted; flagellum not white. 14. *veteratrix*, Tosq.
- (21) 28. Scutellum entirely black. 15. *varius*, Kriech.

1. *Certonotus geniculatus*, sp. n.

A handsome black species, with the mesothorax and metapleurae rich castaneous; the face, clypeus, labrum, cheeks, inner and outer though not vertical orbits, radices, tegulae, scutellum, postscutellum, apical half of metathorax to the concolorous abdominal base, sides and apices of all the segments with small and indefinite lateral spots on sixth and seventh, anterior legs except femora partly and the intermediate tarsi, hind trochanters with apices of their coxae, of their femora and of their tibiae with base of the last, pale stramineous; the tricolored metathorax has no basal area and only a single curved carina on either side, spiracles circumcarinate and elongate-oval; areolet very broadly triangular, nearly twice broader than high, emitting the curved recurrent nervure from its apical third; second recurrent of hind wings strongly curved; nervellus strongly intercepted at its upper fourth; terebra exactly as long as body; length, 19-25 mm. I have seen two pairs of this species, which is similar to *C. monticola*, but much more slender with the wings much narrower, taken by Charles French in Victoria, during February, 1901 and at Nulla Wullen, near Berwick there, by Wooster about 1893.

2. *Certonotus vestigator*, Smith.

Rhyssa vestigator, Smith, Proc. Linn. Soc. Zool. III, 1859, p. 174, ♂.

Krieger described the ♀ of this species under the name *C. similis* (Zeits. Hym.-Dip., 1901, p. 116), according to

Mocsáry, who deals (Ann. Nat. Hist. Mus. Hungr., 1905, p. 8) with both sexes at some length, on the strength of single examples of both from Sattelberg on the east of German New Guinea; Smith knew it (*l.c.* et *l.c.* 1863, p. 10) from the adjacent island of Mysol, whence is a ♀ in the British Museum, and the Aru Islands; and Krieger from Milne Bay in New Guinea.

3. *Certonotus nitidulus*, sp. n.

A bright castaneous species with profuse pale markings and only the flagellum (of which the ten penultimate joints are white), mandibles, frenum, inferior metathoracic areae, posterior tarsi and centre of their tibiae, black. The face, mouth, cheeks, frontal and external though not the vertical orbits, pale stramineous; thorax with a small quadrate spot on centre of mesonotum and one on either side of its apex, radices, tegulae, elongate callosities before and below radices, a small and circular spot at both base and apex of mesopleurae, postscutellum with sides and apex of scutellum, and whole apical third of metathorax concolorous, as also are the sides and apices of all the segments, base of first and small lateral spots on fourth to seventh, the anterior legs except part of femora, the hind trochanters with apices of their femora and tibiae, and base of the latter. Areolet exactly triangular, subsessile above, emitting recurrent nervure from its apical third. Length, 11 mm., with terebra 12 mm. I have seen but a single female of this distinct species.

4. *Certonotus monticola*, sp. n.

Extremely like *C. vestigator*, though differing in several important details. The basal nervure is almost exactly continuous through the median, with the nervulus exactly vertical; the less strongly geniculate second recurrent nervure is emitted immediately beyond the centre, instead of from the apical fourth, of the areolet; the frons is much less strongly impressed on either side; metathorax humped up and very much shorter, flavous with only the extreme apex and the sides narrowly at the base black; its carinae are almost entirely wanting beyond the costulae; the hind tarsi are considerably shorter and the external hind tibial fovea is very distinct. The female type was taken on the Tambourine Mountains, near Brisbane, and received by the British Museum in 1910.

5. *Certonotus rufus*, Moes.

Ann. Nat. Hist. Mus. Hungr. 1905, p. 7, ♀.

A single rufescent female with black, white and castaneous markings, and the terebra 3 mm. longer than the body is described by Mocsáry from Waigiou.

6. *Certonotus labialis*, Cam.

Tijds. v. Ent. I, 1907, p. 43, ♀.

This ferrugineous species, with violaceous wings and mainly black abdomen is 13 mm. in length, with terebra 12 mm. The type, from Merauke in southern Dutch New Guinea, is said to be closely allied to *C. seminiger*, and to differ mainly in its clypeal conformation.

7. *Certonotus seminiger*, Krieg.

Zeits. Hym.-Dip. 1901, p. 119, ♂ ♀.

A ferrugineous species with the abdomen from base of second segment, the hind legs except basally, and the flagellum, black; alar apices infumate; length 13-17 mm. Three specimens are described from Milne Bay in New Guinea, taken by Micholitz.

8. *Certonotus rufescens*, sp. n.

It is remarkable that three distinct species with entirely rufescent body should occur in so restricted an area as do this and the two following insects, and that in the female sex alone. These all agree in their bright brick-red and nitidulous body and legs, with at most the antennae except basally beneath, mandibles, onychii, terebra, stigma, costa and nervures, black, as is the case in the present species, which differs from both the following in the entirely black flagellum, centrally elevated scutellum and total lack of posterior metathoracic transcarina. The scutellum is coarsely and not very closely punctate, gradually and distinctly elevated from base to beyond centre and thence abruptly declived to apex, with no trace of a discal transcarina. The areolet is broadly triangular, coalescent above, emitting recurrent nervure from its apical fourth. Terebra exactly as long as body. Length 12-17 mm. Three females were taken at Mackay in Queensland, one of them in September, 1901, and presented by Gilbert Turner between 1901-9.

9. *Certonotus annulatus*, sp. n.

Exactly like the last in coloration, excepting that the ten apical flagellar joints are pure white, but differing in the deplanate scutellum which is closely and coarsely punctate to its apical third where it is bisected by a complete transcarina, beyond which it becomes coriaceous; in the presence of a strong posterior carina on the disc only of the metathorax; in the distinctly sessile areolet, which emits the recurrent nervure from its apical third. Terebra exactly as long as the body. Length, 13-18 mm. Three females were taken at Kuranda near Cairns in Queensland during December, 1901 and March, 1902.

10. *Certonotus apicalis*, sp. n.

Exactly like the last two species but with the terminal flagellar joint black, preceded by a twelve-jointed white band; with the scutellum strongly nitidulous and very sparsely punctate, and without trace of transcarina; with the posterior metathoracic transcarina entire, though nowhere strong; with the basal segment much shorter and stouter, hardly half as long again as apically broad, whereas in both the above species it is fully twice longer than broad; and with the terebra very much longer than the body. Length 14, with terebra 25, mm.—17, with terebra 32, mm. Four females taken with the above at Kuranda, near Cairns, during March, 1902.

11. *Certonotus humeralifer*, Krieg.

Zeits. Hym.-Dip. 1901, p. 121, ♀.

A luteous species with the flagellum, occipital mark, a central mesonotal mark, scutellar fovea, frenum, terebra and hind tarsi black; basal angles of pronotum tuberculiformly produced; length, 13-15 mm., with terebra 1 mm. longer. Krieger knew four ♀♀ from New South Wales.

12. *Certonotus flaviceps*, Voll.

Rhyssa flaviceps, Voll. Stett. Ent. Zeit. XL, 1879, p. 139, ♀.

I have not seen this female, with the abdomen only laterally pale-marked, of 20 mm. with terebra 25 mm. It was described from the Aru Islands and relegated by Krieger (Zeits. Hym.-Dip. 1901, p. 113) to the present genus, in which it is treated of by Tosquinet (Mém. Soc. Ent. Belg. 1903, p. 103) from New Guinea, where Beccari took the example in the Genoa Museum during February, 1875.

13. *Certonotus hinnuleus*, Krieg.

Zeits. Hym.-Dip. 1901, p. 123, ♀.

A handsome species of 12 mm., with the antennae and badius-black segments apically white, the metathorax partly and scutellum concolorous, the mesonotum rufescent with black vitta and white apical marks. It is best recognised by the entire nervellus which emits no nervure, though the spurious nervure is distinctly visible towards the apex of the hind wing (not shown by Krieger, *l.c.*, pl. ii, fig. 3). Its author knew one female from New South Wales, of which the terebra was 11 mm. to the body's 12 mm.; while one, which I cannot consider distinct, in the British Museum from Western Australia is 12 mm. in length, with the terebra extending only 5 mm. beyond the anus.

14. *Certonotus veteratrix*, Tosq.

Mém. Soc. Ent. Belg. 1903, p. 100, ♀.

The type, in the Genoa Museum, was taken during January, 1894, at Fiuma Parari in New Guinea and termed a *Rhyssa* by its author; but Mocsáry places it in the present genus (*Ann. Nat. Hist. Mus. Hungr.*, 1905, p. 9) and describes the male from Sattelberg in New Guinea.

15. *Certonotus varius*, Kriech.

Ent. Nachr. xv, 1889, p. 308, ♀.

The type of the Genus. Australia.

SUB-FAMILY PIMPLINAE.

TRIBE ECHTHROMORPHIDES.

The two genera here dealt with are so distinct from the whole remainder of the Pimplinae that they may well be monographed as together forming a small tribe characterised by the emission of the spurious nervure from the junction of the cubital and nervellus in the hind wing, by the basally strong sinuate radius of the front ones, by the rostriform mouth with peculiarly elongate cheeks and also, perhaps, by the wanting or obsolete metanotal carinae.

TABLE OF GENERA.

- | | |
|---|------------------------|
| (2) 1. Hind femora dentate beneath ; nervellus antefurcal ; metanotum trituberculate. | LISSOPIMPLA, Kriech. |
| (1) 2. Hind femora simple ; nervulus postfurcal ; metanotum at most bituberculate. | ECHTHROMORPHA, Holmgr. |

LISSOPIMPLA, Kriech.

Ent. Nachr. 1889, p. 309 ; *Trichrus*, Tosq. Mém. Soc. Ent. Belg. 1903, p. 373.

This genus, erected by Kriechbaumer in his "Nova genera et species Pimplidarum," is remarkable for its well-defined characters and Austro-Malay distribution ; but one species, long ago very inadequately described by Francis Walker, extends as far west as Ceylon.

TABLE OF SPECIES.

- | | |
|---|---------------------------------|
| (8) 1. Wings strongly infumate ; thorax entirely or nearly entirely red. | |
| (7) 2. Abdomen basally broadly black. | |
| (6) 3. Metanotal elevation simple ; anus broadly red. | |
| (5) 4. Four basal segments apically white laterally ; metanotum trituberculate. | 1. <i>semipunctata</i> , Kirby. |
| (4) 5. Four basal segments at most obscurely red-marked ; metanotum subbituberculate. | 2. <i>pacifica</i> , sp. n. |

- (3) 6. Metanotal elevation triangularly impressed; abdomen not red-marked. 3. *octoguttata*, Kriech.
- (2) 7. Abdomen not at all black-marked. 4. *concolor*, Krieg.
- (1) 8. Wings hyaline; thorax not or hardly red-marked.
- (14) 9. Recurrent nervure emitted distinctly before apex of areolet.
- (11) 10. Abdomen red with three first segments basally black and flavous-marked. 5. *stupenda*, Tosq.
- (10) 11. Abdomen black with all the segments flavous-marked.
- (13) 12. Segments only pale at apical angles; hind tibiae, and usually venter, black. 6. *scutata*, Krieg.
- (12) 13. Whole segmental apices pale; hind tibiae red, venter black. 7. *albopicta*, Walk.
- (9) 14. Recurrent nervure emitted from apex of areolet. 8. *rufipes*, Cam.

1. *Lissopimpla semipunctata*, Kirby.

Rhyssa semipunctata, Kirby. Trans. Ent. Soc. 1883, p. 202, ♀;
L. decimnotata, Kriech. Ent. Nachr. 1889, p. 310, ♂ ♀.

This species, which was first fully described as *Xenopimpla semipunctata* by Cameron (Manch. Mem. xlii, 1898, No. 1, p. 28, ♂ ♀) occurs throughout the whole of Australia, though not extending to the northern islands; it is very common about Mackay in Queensland, though the largest examples are from Victoria and Western Australia. It is, apparently, much rarer in New Zealand. The typical ♀, in the British Museum, has the first segment immaculate, as in Kriechbaumer's variety, *L. haemorrhoidalis*; I have seen no ♀ with it basally white, as in that of his *L. 10-notata*. The size varies in ♂♂ 11-18 mm. and in ♀♀ 12-25 mm. Specimens in the British Museum are from New South Wales (Port Stephens; Harrington; Sydney on 20th March, 1890; Wellington on 20th Feb., 1891; and a ♀ in Edinburgh Museum); from Victoria (Goulburn River; Lower Plenty; Nilumbill Valley, near Melbourne); from Western Australia (Champion Bay in 1866; Baudin Island, Long Reef in 1891; Swan River; Fremantle; and Perth); from South Australia (Alexandria on the Playford River in April, 1906; Killalpanima, a hundred miles east of Lake Eyre; Adelaide; and Port Darwin); from Queensland (Toowomba; Mackay in May, 1900, where it was bred from the Noctuid moth, *Achoea melicerta*); and from "East Australia." The New Zealand examples are Kirby's type, taken by Skelton at Blenheim in 1883; one from Wellington in 1898; and half a dozen recorded from Greymouth by Cameron. Krieger adds the Fiji Islands.

2. *Lissopimpla pacifica*, sp. n.

This species differs from the last in having both pairs of wings uniformly infumate throughout and the four basal segments with no white spots; in other respects, the scutellum is less strongly carinate, the areolet is distinctly less oblique with the radius strongly reflexed apically, and the second recurrent of lower wings is not at all sinuate; the hind tarsi are no darker than the fulvous hind femora and tibiae; the central elevation of metanotum is strongly carinate on either side and not at all apically produced. Length, 17-21 mm. ♀ only. The type is one of twenty-seven Hymenoptera collected by John Macgillivray, F.R.G.S., in New Caledonia in 1859; and a second is one of three Hymenoptera taken at Kokoda in British New Guinea in 1907 by C. A. W. Monckton; both are in the British Museum.

3. *Lissopimpla octoguttata*, Kriech.

Ent. Nachr. 1889, p. 310.

It is said to have the abdomen entirely black with only the four basal segments—as in *L. semipunctata*—apically white on either side. Respecting its distinction from the same author's *10-notata*, Krieger retained an open opinion in 1899; but it appears distinct both in its black anus and in the strongly sinuate nervellus, which in all the *L. semipunctata* I have seen is “vix flexuosus.” The present insect is vaguely recorded from Australia.

4. *Lissopimpla concolor*, Krieger.

Zeits. Hym.-Dip. VII 1907, p. 300, ♀.

At once known by its uniform dark rust-red coloration; the mesonotum is somewhat closely covered with small hair-bearing punctures. The unique ♀, in the Berlin Museum, was captured at Atapupu on Timor.

5. *Lissopimpla stupenda*, Tosq.

Trichrus stupenda, Tosq., Mém. Soc. Ent. Belg. 1903, p. 374, ♂ ♀.

As Krieger remarked in 1907, this is certainly a *Lissopimpla* though quite distinct from any species known to him or me; the thorax is black with both flavous and fulvous markings, the abdomen is red with the three—not four, as in Kriechbaumer's species—first segments broadly red basally and flavous-marked externally. It was found in Java in 1881.

6. *Lissopimpla scutata*, Krieg.

Sitzb. Nat. Ges. Leipzig 1899, p. 50, figg. 4 et 5, ♂ ♀.

Very like *L. albopicta*, but with a distinct range and at once known by its black hind tibiae and only laterally pale-marked segments. It is only known from Queensland; the type is from Cooktown, and it was found by Turner at Mackay during April to June, as well as by French at Kuranda near Cairns in June, 1902.

7. *Lissopimpla albopicta*, Walk.

Pimpla albopicta, Walk. Ann. Nat. Hist. (3) v, 1860, p. 306, ♀;
L. rufipes, Cam. Spol. Zeyl. III, 1905, p. 140, pl. B, ♀.

Widely distributed and doubtless common throughout India from Ceylon (Walker, E. E. Green, Dr. Thwaites in 1867 and Turner at Kandy in February, 1903) to Sikkim in April, 1891 (Col. Bingham). I have seen it from an altitude of 6,000 feet in the Khasi Hills of Assam and from 7,000 feet in the Nilgiri Hills of Madras. Mr. Green has presented me with a unique ♂, which differs in only sexual directions from the ♀♀ and was captured at Peradeniya in May, 1909. Both Walker's and Cameron's types are in the British Museum. Krieger in 1907 remarks upon the too inferiorly intercepted nervellus of the latter's figure; and this is rectified by Cameron in the paper next quoted.

8. *Lissopimpla rufipes*, Cam.

Proc. Linn. Soc. N. S. Wales 1911, p. 363, ♀.

Another species of this genus was described by Cameron under the same specific name, which is therefore doubtfully valid; but the present may perhaps stand, though its author was not aware in erecting it that the former one was pre-occupied by Walker. The present species is from the Solomon Islands, nine hundred miles from Cooktown. The description agrees in every point with that of *L. scutata* (to which its author does not refer), excepting in its centrally rufescent hind tibiae, the smooth notauli and the second recurrent nervure, which is continuous with the external intercubital nervure.

ECHTHROMORPHA, Holmgr.

Eugenies Resa. Insect. 1868, 406.

This genus is especially interesting on account of the individual distribution of its species, which appears to

radiate from the Malay Archipelago to Australia and Tasmania, the Pacific island-groups of Hawaii, Society, Fiji, Solomon and New Caledonia, whence I have been enabled to describe no less than three new species in this and the foregoing genus; to Ceylon and Assam, through Burma and Tenasserim, as far east as Siam; none are known from Arabia and it seems probable that the genus reaches Africa solely by way of the Seychelles Islands, Mauritius and Madagascar. On that Continent a single species is known, differing slightly on the east and west coasts, and but little from the Indian representative; on the east it ranges from Mombasa to Durban, and on the west sparingly from Togoland through the Congo to Sierra Leone; and a peculiar kind is found only on St. Helena. This species has been recorded by Krieger, upon insufficient evidence, also from north America and he describes both sexes of another from Brazil, with a partly illegible label: I have seen none from the new world. I have experienced little difficulty in elucidating the species, since Dr. Prof. R. Krieger has given us so complete and comprehensive a monograph of the genus in *Mitteilungen aus dem Zoologischen Museum in Berlin*, 1908, pp. 295-344. *Echthromorpha*, Tscheck, is synonymised by Dalla Torre with *Anilasta*, Thoms., and can have no connection with the present genus.

TABLE OF SPECIES.

- (6) 1. Metathoracic apophyses very distinct; black or blue spp., whitish-spotted.
- (5) 2. Body not at all metallic blue; legs and antennae red.
- (4) 3. Anus and the subdeplanate scutellum black.
 - 1. *intricatoria*, Fab.
- (3) 4. Anus and the tectiform scutellum fulvous.
 - 2. *bitecta*, sp. n.
- (2) 5. Body entirely cyaneous-blue; legs and antennae black.
 - 3. *exquisita*, sp. n.
- (1) 6. Metathorax with no, or deplanate, tubercles; more or less broadly red spp.
- (14) 7. Face very coarsely punctate, and centrally not smooth.
- (11) 8. Body rust-red, at most ocellar region black: face $1\frac{1}{2}$ broader than high.
- (10) 9. Wings apically immaculate; first segment hardly longer than its apical breadth.
 - 4. *maxima*, Krieg.
- (9) 10. Wings apically black-spotted; first segment one-third longer than its apical breadth.
 - 5. *plagiata*, Smith.
- (8) 11. Body flavidous, not red; face not or hardly broader than high.
- (13) 12. Scutellum tectiform, with its vertex rounded; hind femora black-marked; metanotum with a subquadrate black spot.
 - 6. *gnathon*, Krieg.

- (12) 13. Scutellum subhemispherical ; hind femora ferrugineous-marked ; metanotum with a triangular spot. 7. *tridens*, Krieg.
- (7) 14. Face not coarsely punctate, its centre smooth.
- (16) 15. Mesopleurae dull and closely punctate; body black. 8. *atrata*, Holmgr.
- (15) 16. Mesopleurae not dull, sparsely punctate ; body pale, or pale-marked.
- (18) 17. Mesopleurae with a large, obtuse conical callosity. 9. *conopleura*, Krieg.
- (17) 18. Mesopleurae with no such callosity.
- (28) 19. Body nearly entirely black ; flavous mesonotal vittae wanting.
- (23) 20. Wings with no apical dark marks ; scutellum hemispherical.
- (22) 21. Body red-marked ; scutellum not flavous ; segmental apices dark. 10. *immaculata*, Krieg.
- (21) 22. Body not red-marked ; scutellum and apices flavous. 11. *walkeri*, Cam.
- (20) 23. Wings apically dark-marked ; scutellum not hemispherical.
- (27) 24. Scutellum strongly convex ; mesopleurae entirely black.
- (26) 25. ♂ face not at all pale ; areolet petiolate ; gastrocoeli of central segments wanting. 12. *maculipennis*, Hlgr.
- (25) 26. ♂ face entirely flavous ; areolet subsessile ; gastrocoeli of central segments translucent. 13. *flavo-orbitalis*, Cam.
- (24) 27. Scutellum but slightly convex ; mesopleurae red-marked. 14. *nigricans*, Krieg.
- (19) 28. Body not nearly entirely black ; mesonotum flavous or flavous-striped.
- (40) 29. Mesonotum black with two pale vittae.
- (31) 30. Second segment shining, diffusely punctate ; body not flavous-marked. 15. *macula*, Brullé.
- (30) 31. Second segment duller ; body always flavous-marked.
- (33) 32. Pronotal sulcus basally striate 16. *agrestoria*, Swed.
- (32) 33. Pronotal sulcus basally quite smooth.
- (35) 34. Metanotum with no black markings at all 17. *insidiator*, Smith.
- (34) 35. Metanotum with at least one central black vitta.
- (37) 36. Pale apices of second-fifth segments not centrally interrupted. 18. *notulatoria*, Fab.
- (36) 37. Pale apices of central segments discally black.
- (39) 38. Areolet broad, not petiolate ; antennae stouter and rufescent ; hind coxae entirely red. 19. *inermis*, sp. n.
- (38) 39. Areolet narrow, petiolate ; antennae slender and black ; hind coxae black and flavous 20. *variegata*, Brullé.
- (29) 40. Mesonotum rust-red, at most with a single black vitta.
- (46) 41. Wings not apically infumate ; ♀ second segment densely punctate.
- (43) 42. Mesopleurae and centre of abdomen broadly black. 21. *diversor*, sp. n.

- (42) 43. Mesopleurae and abdomen not, or hardly, at all black.
 (45) 44. Metanotum glabrous and not impressed; mesonotum strongly nitidulous; occiput black. 22. *hyalina*, Sauss.
 (44) 45. Metanotum trans-striate and centrally impressed; mesonotum closely punctate, dull; occiput red. 23. *rufa*, Cam.
 (41) 46. Wings apically infumate; ♀ second segment sparsely punctate. 24. *semperi*, Krieg.

1. *Echthromorpha intricatoria*, Fab.

Cryptus intricatorius, Fab., Piez. 77, ♀.

A common Australian and Tasmanian species, though not extending in Queensland as far north as Mackay. In the British Museum it is represented from Adelaide, 1887 (B. Nevins); "East Australia," 1910 (Dr. T. P. Lucas); one ♂ in south Queensland in February, 1901 (C. French); Lower Plenty (R. Bakewell), Port Phillip, 1854 (Col. Bolton), Melbourne in August, 1900 (C. French), and others from Victoria (Prof. Spencer and F. du Boulay); Sydney in March, 1898 (de la Garde), and in 1890 (Froggatt), Taralga (Dr. Broom); other Australian specimens are from North Hole (Hunter), and three, of which one was bred "from larva of a large Bombyx," from H. G. Harrington in 1844. It is common in Tasmania and adjacent islands: two ex. coll. Ent. Soc. in 1858; two from S.E. Tasmania in 1877 (E. D. Atkinson); another the same year (A. Simson); two from Allport of Hobart in 1854; three from Hobart in 1891 (the Admiralty) and in 1844 (Dr. Byne). Prof. Spencer took it at King Island in 1888. I know no species of the present genus which at all agrees with the crude figure of an insect, referred to the present by Schmiedeknecht at Gen. Insect. 1907, pl. i, fig. 3 (fig. 2 *sic*, p. 28). A single ♂ in the Oxford University Museum is, perhaps, erroneously labelled "India."

2. *Echthromorpha bitecta*, sp. n.

Superficially similar to *E. diversor* in coloration but instantly known from all other species by the strong, sub-circular and distinctly tectiform stramineous apophyses on either side of the transaciculate metathorax, which is otherwise black, excepting a large flavous callosity above each hind coxa. Black, and nitidulous with the mesonotum closely sculptured, dull and longitudinally red centrally; prothorax entirely fulvidous, with the adjoining part of mesosternum concolorous and mesopleurae flavous; head

fulvous with the face and mouth flavous, eyes piceous and ocelli slightly nigrescent; antennae unusually long, distinctly longer than body and slender with the joints both basally and apically nodose, fulvous beneath; scutellar region and frenum entirely flavidous with scutellum, postscutellum and basal carinae of the former's sulcus citrinous; abdomen black with apical angles of the four basal segments obliquely flavidous, and the anus from centre of the next entirely bright brick-red; legs immaculate pale fulvous; wings subflavescent with a determinate subapical infumate spot, and the stigma luteous. Length, 13 mm. ♂ only. The type was taken by John Macgillivray, F.R.G.S., in New Caledonia in 1859, and is in the British Museum.

3. *Echthromorpha exquisita*, sp. n.

The last and finest species taken by Macgillivray in New Caledonia is represented in the British Museum by a single pair. It is instantly known by the brilliantly metallic cyaneous coloration of the whole body, the dead black antennae and small pure white markings. Head with all the orbits narrowly, a small spot on either side of the clypeal apex and the mouth white; face strongly punctate; thorax with propleural margin, a spot at apices of the deeply impressed notauli, apical half of tegulae and basal scutellar carinae, a dot beneath all the radices with one in centre of mesopleural apex and another immediately above the intermediate coxae, postscutellum and all scutellar lateral carinae, with small and subapical metathoracic apophyses, and dots above hind coxae, white; abdomen strongly punctate with apical angles of all the segments, discally coalescent on basal two of ♀, white; terebra half length of abdomen; legs with front coxae except above, their tarsi and trochanters, anterior tibiae except the intermediate externally, inner side of front and towards their apices of intermediate femora, and a discal spot on hind coxae, dead white; wings hyaline, with stigma black and the ♂ areolet a little petiolate. Length, 16 mm. ♂ ♀.

4. *Echthromorpha maxima*, Krieg.

Mitt. Zool. Mus. Berl. 1908, p. 334, ♀.

An entirely distinct species in its large size (27 mm. in type; those in the British Museum being 22-24 mm.), entirely fulvous body, closely punctate face and immaculate, flavescient wings. The antennae—broken in type—are nearly as

long as body, a little attenuate at both extremities and deep black, with only the scape fulvous. Krieger knew but a single ♀ in Mus. Wien., taken on Amboyna in the Moluccas about 1859; the British Museum contains four ♀♀ from Queensland, of which the earliest was sent from Moreton Bay in 1852, the next was found there by Mrs. Diggles in 1863, and the last two were taken at Mackay in September, 1894, and bred at Townsville on 3rd December, 1901, by F. P. Dodd from *Ornithoptera euphorion*, Gray.

5. *Echthromorpha plagiata*, Smith.

Pimpla plagiata, Smith, Proc. Linn. Soc. Zool. III, 1859, p. 173, ♀.

Smith named a single ♀ in the British Museum, which was taken on Aru (the typical locality) by Alfred Wallace, and is a co-type; Prof. Poulton informs me the type is at Oxford. It has the face coarsely punctate and agrees in every way with *E. fastigata*, Krieg. (Mitt. Zool. Mus. Berl., 1908, p. 336 ♀), differing from *E. insidiator*—which it superficially most strongly resembles—in much the same way that *E. hyalina* does from *E. rufa*. Krieger's ♀ in the Vienna Museum was taken further north, on Batchian Island, in the Moluccas.

6 et 7. *Echthromorpha gnathon* et *tridens*, Krieg.

Mitt. Zool. Mus. Berl. 1908, p. 337 and 339.

I know neither of these Malay species.

8. *Echthromorpha atrata*, Holmgr.

Eugenies Resa. Insect. 1868, 407, pl. viii, fig. 3, ♀.

The figure is useless, but Holmgren is very distinct in his locality, "St. Helena," for his typical ♀ of 16 mm. and another of but half the size. No one has recorded it thence since that time, and I consider Krieger's single ♀, said to have come from North America—on the strength of its cryptic label "Am. spt."—certainly distinct, if its speculum be (as stated) smooth, for the mesopleurae of true *E. atrata* are, as stated by Holmgren, "creberrime alutaceo-punctatus" throughout. There are six examples in the British Museum, comprising the sexes in equal number; the ♂, hitherto unknown, differs in no way excepting its possibly paler mouth; the size varies to a remarkable extent thus: ♀♀ 8½-14 mm., ♂♂ 5½-8½ mm. These were all captured on St. Helena (at Nine Tree Gut, Plantation, and West Lodge) by the late T. V. Wollaston.

9 et 10. *Echthromorpha conopleura* et *immaculata*,
Krieg.

Mitt. Zool. Mus. Berl. 1908, pp. 321 and 331.

These two species, from the Brazils and the Fiji Islands respectively, I have not seen.

11. *Echthromorpha walkeri*, Cam.

Proc. and Trans. Nat. Hist. Soc. Glasgow 1 (New Series), 1887,
p. 265, ♂.

Established on a single ♂ taken by J. J. Walker at Tahiti in the Society Islands, this species, the type of which is in the British Museum, was unknown to Krieger, who naturally guessed it to be probably synonymous with his *E. striata*. This, however, can hardly be the case, in spite of the divergence of sexual coloration in *E. insidiator*, etc., for it is actually more closely allied to *E. immaculata* in its hyaline wings, mainly black body and immaculate mesonotum. The colour is very distinct, being black with no trace of red; the face, mouth, orbits narrowly, scape beneath, callosity below front radices, centre of mesopleurae and a large dorso-lateral mark on metathorax, flavous; scutellum and postscutellum, apices of six basal segments except centrally, anterior coxae and internal discal marks on the hind ones are concolorous; the legs are nigrescent, with the front ones dull ochreous and the underside of the posterior femora flavescent; abdomen diffusely and not very finely punctate throughout, with the basal segment finely trans-aciculate; pronotum basally striate.

12. *Echthromorpha maculipennis*, Holmgr.

Eugenies Resa. Insect. 1868, 406, ♂ ♀.

Honolulu on Oahu (Holmgren); a ♂ thence from the Rev. T. Blackburn (*cf.* Manch. Soc. Proc., 1886, p. 178 et Mem. Manch. Soc. x (3), 1887, p. 239) is in the British Museum, with an old ♀ simply labelled "Oahu." Subsequently it has been found on Hawaii, Kanai, Lanai, Maui and Molokai, usually at an altitude of 2,000-4,000 feet, during March-May and July-September, when it has been bred from the larva of a geometrid moth infesting cocoanut palms.

13. *Echthromorpha flavo-orbitalis*, Cam.

Proc. Manch. Soc. 1886, p. 178; Mem. Manch. Soc. 1887, p. 239.

The ♂ described under this name by Cameron is extremely like that of the last species, differing mainly in its very

strongly shining abdomen, the segments of which, however, are given by its author as "marelaevioribus magisque nitidis." The face of his ♂ was black, and we may temporarily consider this a good species on account of its flavous face and scutellar apex, though the wings are not constantly darker and the metanotal depression doubtless varies. Its author, whose type is in the British Museum, thought it possibly a variety of *E. maculipennis*; but Ashmead (Fauna Hawaiiensis, vol. 1, pt. iii, p. 336) tabulates both sexes, differentiating the ♀ of the present by its flavidous anterior orbits, a poor pedal character and an erroneous anal one, for the pygidium is frequently ferrugineous in Holmgren's species, than which this is much rarer, occurring only at Hilo on Hawaii during July and in the mountains of Molakai at 4,500 to 5,000 feet in June.

14. *Echthromorpha nigricans*, Krieg.

Mitt. Zool. Mus. Berl. 1908, p. 325.

Madagascar.

15. *Echthromorpha macula*, Brullé.

Hist. Nat. Hym. 1846, iv, p. 89, ♀.

The variety *vittata*, Brullé (*lib. cit.* 89, ♂ ♀), is distinct in its ferrugineous and more or less black, though never flavous-marked, body with strongly nitidulous abdomen and apically transaciculate metathorax; it is very like some red-brown forms of *E. variegator*—which I can differentiate only by its flavous scutellum and abdominal apex—but bears no traces of any tendency towards flavous markings on scutellum or abdominal apex, which are both uniformly red. The ♀, and possibly the ♂, scutellum is entirely glabrous with but obsolete pilosity, very unlike the long pile of that species. The ♂ has not before been noted: J. E. M. Brown presented one to the Edinburgh Museum of Science and Art in 1897, and another to the British Museum from Mauritius in 1899; and there is also at the latter a single ♀ from "Ile de France," whence Brullé (*l.c.*, 90) first recorded his var. *vittata* of the present species, along with *Pimpla macula* from "l'île Bourbon"; Saussure has figured the type form beautifully at pl. xx, fig. 2 of Grandidier's book on Madagascar, though I know of no records thence, and Tosquinet (Mém. Soc. Ent. Belg. 1896, p. 308) records it from Bourbon. It is known from no other locality, and the record for "Promontorium bonae Spei" given by

Krieger is probably used in its widest sense. A single ♀ of the type form in Rev. T. A. Marshall's collection is labelled "Ilha do Principe, G. of Guinea"—doubtless in error.

16. *Echthromorpha agrestoria*, Swed.

Ichneumon Agrestorius, Swed. Sv. Ak. Handl. VIII, 1787, p. 279
Gmel. Syst. Nat. 1790, p. 2679, ♀; cf. Morl. Entom. 1909, p. 135;
E. striata, Krieger, Mitt. Zool. Mus. Berl. 1908, p. 306, ♀.

The excellent description of *E. striata* by Krieger leaves no room for doubt that it is identical with Swederus' species, the type of which is preserved in the Banks Collection in the British Museum, "habitat in Insula Otaheiti." Dr. Coppinger presented a second female, taken during August, 1880, at Tahiti (see his account in "Cruise of the 'Alert'; four years in Patagonian, Polynesian, and Mascarene Waters," London, 1883, p. 144; part of the insects captured, though no hymenoptera, were described in the "Report on Collections made during the Voyage of H.M.S. 'Alert'" published by the British Museum Trustees in 1884). Krieger found four ♀♀ thence in the Vienna Museum. It is extremely like the Indian species, and I can separate them only by the basally striate pronotum, the much smaller apical alar spot and perhaps also—though doubtfully constant—by the transaciculate basal half of petiole, as well as the smooth and not at all punctate segmental apices.

17. *Echthromorpha insidiator*, Smith.

Pimpla insidiator, Smith, Proc. Linn. Soc. Zool. VII, 1863,
p. 9, ♂ ♀.

Differs from *E. plagiata* in its sparsely punctate and centrally subglabrous face, and in the laterally dull and closely punctate metathorax and whole ♀ abdomen. This is an entirely distinct species from *Ichneumon insidiator*, Smith, Trans. Ent. Soc., 1876, p. 476—erroneously placed instead of it by DT. and Schm. Gen. Insect. 1907, p. 28—which is a true ♂ *Ichneumon*, probably of the same author's *I. perfidiosus* (l.c. p. 475, pl. iv, fig. 5), in which the hypopygium is distinctly retracted from base of terebra. Smith records both sexes of the present insect only from Mysol; the type is at Oxford (*teste* Poulton), and four co-types thence are in the British Museum with other examples from Salwatty in Celebes (Wallace), Mimika River in July and Wataikwa River in August in New Guinea during 1911 (A. F. R. Wollaston), Gilbert Islands in 1885 (C. M. Woodford), and a fine series of both sexes from Kuranda, near Cairns, January, 1902,

and Mackay in Queensland, always during May, 1894-1900. Cameron—who gives the reference incorrectly—saw it from Merauke in New Guinea (Tijds. v. Ent. 1, 1907, p. 44). It is further known to occur on New Britain, Flores and Batchian Islands, to which Vollenhoven (Stett. Ent. Zeit. 1879, p. 149) adds "Ternate, Timor, Waigeou, Gebeh, Aru und van-Diemen's-land." Its most northern locality is, perhaps, Indrulaman, whence are two ♀♀ in the British Museum ex coll. Bingham; I have also seen it in the Genoa Museum from Bhamo in Burma.

18. *Echthromorpha notulatoria*, Fab.

Cryptus notulatorius, Fab. Piez. 1804, p. 77; *Pimpla continua*, Brullé, Nat. Hym. 1846, p. 92, ♀; *Chrysopimpla ornatipes*, Cam., Manch. Mem. 1899, p. 186, pl. iii, fig. 6.

This very common and oft-described Indian species is easily recognised by its colour—though hardly distinct from *E. insidiator*, perhaps, in sculpture—from both Austro-Malay and African species, since the former have the metathorax immaculate fulvous and the latter the pale segmental apices centrally interrupted by black, whereas here the metathorax is longitudinally black centrally and the segmental apices are entirely pale: with obsoletely punctate face. Krieger has erected a variety, with no anal rufescence, called by him *insulana* in 1908; but this is synonymous with Cameron's *Echthromorpha laeva* (Journ. Str. Br. R. Asiatic Soc. 1903, p. 135, ♂=*E. maculipes*, Cam. lib. cit., 1905, p. 121, ♀); it is a southern form recorded by him from Sumatra, Borneo and Batchian; the British Museum contains the type of both *E. laeva* and *E. maculipes*, taken at Kuching, a ♂ co-type from Sarawak in January, 1899, a nice series of half a dozen which include both sexes from Singapore found by H. N. Ridley, and a ♂ also taken by him at Malacca on the mainland. I do not think that *Pimpla pulchrimaculata*, Cam. (Manch. Mem. xli, 1897, No. 4, p. 20, ♀) belongs here, as queried by Krieger; its abdomen is not said to be flavous-banded; but Cameron's *Chrysopimpla persimilis* (l.c. 1899, p. 188) is very possibly synonymous. The type form is represented by a long series, taken by Col. Godwin-Austen in the north Khasi Hills of Assam; by Cameron's ♂ and ♀ types of his entirely synonymous *Chrysopimpla ornatipes* (cf. Spol. Zeyl. III, 1905, p. 135, pl. B, fig. 8) from the same district; by examples from the East India Museum in 1879, and taken by Capt. Laing in Oudh during October, 1867. Col. Bingham took but two ♀♀ of this species in Sikkim and his

only two Indian ♂♂ in the British Museum are unlocalised ; the latter differ from the typical form in lacking all trace of apical alar infumescence, and I propose to term this form *immaculata*, var. nov. Krieger's material was very scanty : a couple of each sex from Ceylon, whence Green and Wickwar send it to me, and from Pekon on the Loikaw River and Nam Hou in Laos, Siam ; he says the length extends to no more than 12.5 mm., but one of our ♀♀ reaches fully 15 mm., and Cameron's *E. robusta* (Journ. Str. Br. R. Asiatic Soc. 1905, p. 120, ♀), which I do not know, measures 17 mm. Krieger did not tabulate *E. punctum*, Brullé (Hist. Nat. Hym. 1846, 87) from l'île de Manille, considering it probably a form of the present species ; at Spolia Hym. 1906, p. 105, Schulz says it is represented in the Strasburg Museum, from Mindanao, but adds no descriptive distinctions, though considering it a good species.

19. *Echthromorpha inermis*, sp. n.

This species differs from *E. bitecta* only in its lack of apophyses, though their position is still pale, in the centrally glabrous and basally distinctly punctate metathorax, whose pleurae are not pale-marked ; in its black frons, occiput and ocellar region, its black mesonotum with the tegulae broadly, and two parallel discal vittae extending nearly to the scutellar fovea, flavous ; in the scutellar region being less broadly pale with its basal angles not citrinous ; the abdomen and wings are identical, but the antennae are shorter, not longer than the body, with their joints but weakly nodulose and their under side darker. Length 13 mm. ♂ only. The third new species of this group from New Caledonia brought home by John Macgillivray, F.R.G.S., in 1859, and now in the British Museum.

20. *Echthromorpha variegata*, Brullé.

Hist. Nat. Hym. iv, 1846, p. 91, ♀ ; *Polyamma continuum* Kriech. Berl. Ent. Zeit. 1894, p. 304.

An abundant species throughout tropical Africa, the eastern specimens differing from the western in the much paler general coloration, more broadly red abdomen, and the flavidous ♂ mesosternum ; in all its forms it constantly (and, I think, only) differs from *E. notulatoria* in the centrally interrupted pale segmental apices. Of the typical and eastern form, of which *Polyamma continuum*, Kriech. is certainly the

♂; Krieger knew twenty-seven specimens of both sexes from Nyassaland, German East Africa, Delagoa Bay and Durban. This form is represented in the British Museum by a ♂ bred from a lepidopterous chrysalis on 20th July, 1906, at Mombasa (A. J. Cholmley); three ♀♀ from Masongaleni at 3,000 feet on 1st April, and a ♀ about Voi at only 800 feet on 22nd March, 1911, in British East Africa (S. A. Neave); four ♀♀ from Mozambique (Rev. T. A. Marshall) and one taken near the Chirinda Forest in Gazaland, Rhodesia, in March, 1907 (Guy Marshall); a ♀ from Salisbury in Mashonaland during February, 1900 (*id.*), and three from Bloksberg near Johannesburg in 1907 (C. H. Peard); further south it seems rarer and there are but four, three of which are ♂♂, from Durban, Natal, in both 1849 and 1860 (Gueinzus), and in 1902 (F. Muir); and from Tongaat during 1909 (H. C. Burnup). The coast specimens from Mozambique and Durban closely approach *E. macula* in coloration, though the segmental apices remain flavous. The western form must be known as var. *interrupta*, Kriech. (*loc. cit.* p. 50), though renamed var. *occidentalis* by Krieger in 1908; for *Pimpla interrupta*, Brullé, from New Holland, cannot be confused with an African variety. This form appears much rarer than the eastern; it is recorded only from Togoland, Guinea, and two ♀♀ from Sierra Leone. From the last locality are a pair in the British Museum, taken in 1842 by Rev. D. F. Morgan, and females in 1858 by James Foxcroft, with another in 1893 by Captain W. G. Clements; in 1911, W. P. Lowe presented two large ♀♀ of 18 mm. from the Gold and Liberian coasts; and so long ago as 1843 three more were secured on the Congo by Dr. Curror, R.N.

21. *Echthromorpha diversor*, sp. n.

A single ♂, in the British Museum, was taken by Sir John Liddell in the Solomon Islands or New Hebrides, and differs so far from any described species of the present genus as to superficially resemble *Lissopimpla pacifica* much more closely in coloration, since it is of exactly the same deep rufescent tinge with the frons, ocellar region and occiput, antennae except underside of scape, a longitudinal central mesonotal vitta, mesopleurae except apically, and the metapleurae centrally at their base, with the second to fourth segments entirely, black; hind tarsi infusate; the abdomen and metathorax subglabrous and strongly nitidulous; scutellum very strongly convex.

22. *Echthromorpha hyalina*, Sauss.

Sauss. Grand. Hist. Madag. xx, 1892, pl. xvi, figg. 1 et la, ♂.

Krieger's description of both sexes leaves nothing to be desired; the length he gives as ♂ 10 mm., and ♀ 12.5-15 mm. In the British Museum is a single pair of 14 mm., the ♀ taken by Edward Smith at Tamatave on the middle of the east coast and the ♂ also from Madagascar acquired through Doncaster, both received in 1881. Both these show traces of infusate mesonotal vittae, as figured by Saussure and correctly thought varietal by Krieger, as well as the former's conspicuously black occiput. Only half a dozen examples are yet known, all from Madagascar.

23. *Echthromorpha rufa*, Cam.

Trans. Linn. Soc. xii, 1907, p. 80, ♂ ♀.

Very similar to the last species, but certainly distinct in its much duller and more closely punctate whole body, longitudinally elevated and impressed metanotum, uniform ferrugineous colour with hardly more than the antennae except basally, eyes and pulvilli black; the occiput is never black. The original pair (♀ type) from the Seychelles Islands in 1906, is in the British Museum, together with a good series taken there by Hugh Scott during 1908 on Silhouette, Mahé, etc., for details of which see my paper on Seychelles Ichneumonidae (Trans. Linn. Soc., 1912, p. 171).

24. *Echthromorpha semperi*, Krieg.

Mitt. Zool. Mus. Berl. 1908, p. 329, ♂ ♀; *E. pallidilineata*, Cam. Proc. Linn. Soc. N.S. Wales 1911, p. 361, ♀.

I cannot understand how Cameron can have failed to recognise Krieger's Palao Island species in his own Solomon Island ♀; the descriptions agree and a single ♂, taken in the latter locality by C. M. Woodford, and acquired by the British Museum in 1887, agrees in every way with the former's account; its antennae are nearly as long as the body, fulvous and hardly darker apically, with the joints strongly nodose and the apical one conical; the stigma and nervures are paler than in the ♀, with the pale abdominal margins much less distinct.

SUB-FAMILY OPHIONINAE.

TRIBE ANOMALIDES.

This tribe is world-wide in its distribution, though as far as our present knowledge extends very rare in Africa, where one was recorded from the Cape by Brullé, one from Algiers, to which doubtless many European species extend, by Schmiedeknecht and two by Tosquinet, who also brought forward a new genus of two species, *Ophionopsis* (Mém. Soc. Ent. Belg., 1903, p. 389) from east Africa. It appears distinctly uncommon in Australasia, and Turner in the course of twenty years took but a very few specimens in Queensland; the British Museum contains but some half-dozen more from Victoria; Brullé described a single species from "la terre de Van-Diemen" and "la Nouvelle-Hollande"; and two more were recorded in the "Entomologist" for 1896. These insects are very prevalent in the palaearctic region, where the species though not the extent of their distribution are well known. Few of them seem to extend as far east as India, whence I can instance but twenty-nine different kinds. North America seems much richer in species, many of which are very beautiful, but there is great need of these being relegated to their correct genera, which task I have been unable to attempt on account of the paucity of material from that region in the British Museum. On the other hand, we have fine Mexican collections, from which I have tried to elucidate this part of the fauna; and in so doing I have had to erect a few new genera for the captures of Bates and others in the neotropics. I consider the genus *Xiphosoma* and its immediate allies better placed under the *Pristomerides*, but have treated of them here, since here they have hitherto been regarded to belong.

TABLE OF GENERA.

- | | |
|-----|---|
| (6) | 1. Hind femora distinctly denticulate before apices.
[PRISTOMERIDES, partim.] |
| (5) | 2. Submarginal nervure distinct; metathorax not transcarinate. |
| (4) | 3. Hind wing nervures apically wanting; metanotum sulcate.
EIPHOSOMA, Cresson. |
| (3) | 4. Hind wing nervures strong; metanotum not sulcate.
NESANOMALON, Morl., gen. nov. |

- (2) 5. Submarginal nervure wanting; metathorax transcarinate.
XIPHOSOMELLA, Szépl.
- (1) 6. Hind femora mutic, not at all denticulate below.
[ANOMALIDES].
- (8) 7. Areolet subcomplete; mesonotum entirely glabrous.
METANOMALON, Morl., gen. nov. ✓
- (7) 8. Areolet entirely wanting; mesonotum sculptured.
- (12) 9. Eyes distinctly pilose; scutellum usually apically emarginate.
- (11) 10. Basal flagellar joint sinuate; nervellus entire: anal nervure continuous with median.
PODOGASTER, Brullé. ✓
- (10) 11. Basal flagellar joint not sinuate; nervellus geniculate; anal nervure not continuous.
TRICHOMMA, Wesm.
- (9) 12. Eyes glabrous; scutellum not apically emarginate.
- (14) 13. Apex of clypeus broadly reflexed and bilobed.
SCHIZOLOMA, Wesm.
- (13) 14. Apex of clypeus neither reflexed nor bilobed.
- (16) 15. Hind metatarsus nearly four times length of second.
HETEROPELMA, Wesm.
- (15) 16. First hind tarsal joint hardly longer than double second.
- (30) 17. Nervellus distinctly intercepted and geniculate.
- (19) 18. First recurrent nervure emitted near centre of first cubital.
EXOCHILUM, Wesm.
- (18) 19. First recurrent emitted very distinctly before centre of first cubital.
- (25) 20. Second recurrent continuous with submarginal nervure.
- (22) 21. Head strongly buccate; hind tarsi spatuliform.
MAGNIBUCCA, Morl., gen. nov.
- (21) 22. Head not strongly buccate; hind tarsi normal.
- (24) 23. Parallel nervure emitted above centre of brachial cell.
BARYLYPA, Först.
- (23) 24. Parallel nervure emitted at or below its centre.
ERIGORGUS, Först.
- (20) 25. Second recurrent emitted beyond submarginal nervure.
- (27) 26. Anal nervure emitted below centre of the externally explanate brachial cell.
ANOMALON, Jurine.
- (26) 27. Anal nervure emitted at or above centre of the parallel-sided brachial cell.
- (29) 28. Metathorax rugose; eyes normal; wings hyaline.
LABRORYCHUS, Först.
- (28) 29. Metathorax glabrous; eyes prominent: wings spotted.
SPILANOMALON, Morl., gen. nov.
- (17) 30. Nervellus neither intercepted nor geniculate.
- (32) 31. Neuration of hind wings more or less complete.
AGRYPON, Först.
- (31) 32. Neuration of hind wings entirely wanting towards their apices.
- (34) 33. Front wings with neuration complete throughout.
PARANIA, Morl., gen. nov.
- (33) 34. Front wings with all neuration wanting apically.
PHARSALIA, Cresson.

EIPHOSOMA, Crèsson.

Proc. Ent. Soc. Philad. IV., 1865, p. 52; *Xiphosoma*, Marshall, Ann. Soc. Ent. France 1892, p. 65.

This genus is related to the *Pristomerides* in its dentate hind femora and to the *Anomalides* in its narrow stigma. Cresson originally thought it "closely allied to *Cremastus*" in 1865 and keeps it there, far from *Anomalon*, in 1872; Ashmead definitely places it in his *Pristomerini* in 1896, but in 1900 (Proc. U. S. Nat. Mus. XXIII, p. 89) sets *Eiphosoma*, without remark, in the *Anomalini*, possibly because the Rev. T. A. Marshall had said in his account of the Hymenoptera of the "Voyage de M. E. Simon au Venezuela" (Ann. Soc. Fr. 1892, p. 65) that "Les espèces de *Xiphosoma* ont presque la même physionomie que les *Anomalon* de l'Europe, et sont fort difficiles à separer"—*inter se*. Here also he points out the similarity between the Greek Ξ and modern E, which had led to Cresson's misprint. Even now the rectified name, *Xiphosoma*, is preoccupied by Spix in Reptilia, and Szépligeti's Tribal name, *Xiphosominae* must go with it. Though Cameron instances three species of this genus (Biol. Centr. Amer., 1886, p. 302), extending the distribution of one to Guatemala, he certainly did not know it, since he described the abundant *E. vitticolle* as new. Krieger shows (Zeits. Hym.-Dip. 1903, p. 291) that *Collyria*, Brullé (Nat. Hist. Hym., 1846, p. 177; *nec* Schiödte) is synonymous with the present genus.

TABLE OF SPECIES.

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|------|--|
| (4) | 1. Alar apices infumate; hind femora often unicolorous. |
| (3) | 2. Hind legs entirely flavous; terebra one-third of body.
1. <i>atrovittatum</i> , Cress. |
| (2) | 3. Hind legs red and black; terebra about half body.
2. <i>azteca</i> , Cress. |
| (1) | 4. Wings entirely hyaline; hind femora fulvous, basally infusate. |
| (12) | 5. Metanotum black-trivittate; hind coxae broadly black-marked. |
| (7) | 6. Scutellum, thorax and abdomen nearly entirely black.
3. <i>parana</i> , sp. n. |
| (6) | 7. Scutellum, thorax and abdomen mainly flavidous. |
| (9) | 8. Only scape beneath flavidous; hind femora tricoloured.
4. <i>texana</i> , Cress. |
| (8) | 9. Two basal antennal joints flavous; hind femora bicoloured. |
| (11) | 10. Mesonotum densely and finely punctate hind tibiae pale banded.
5. <i>annulatum</i> , Cress. |

- (10) 11. Mesonotum sparsely and coarsely punctate; hind tibiae black. 6. *pyralidis*, Ashm.
 (5) 12. Metanotum black-univittate; hind coxae usually unicolorous flavous.
 (16) 13. Areolet entire; metathorax centrally black throughout.
 (15) 14. Central mesonotal lobe, like the lateral, sparsely punctate; length, 19 mm. 7. *mexicana*, Cress.
 (14) 15. Central mesonotal lobe closely punctate, the lateral glabrous; length, 15 mm. 8. *vitticolle*, Cress.
 (13) 16. Areolet wanting; metathorax but shortly black. *vitticolle*, var. *nigrovittatum*, Cress.

1. *Eiphosoma atrovittatum*, Cress.

Proc. Ent. Soc. Philad. 1865, p. 52, ♀.

"Yellow; posterior legs and abdomen dull honey-yellow; three lines on mesothorax, three on metathorax and an oblique one on pleurae, black; wings hyaline, tips fuscous, areolet minute, oblique and petiolated"; length, 7 lines. Two Cuban ♀♀ in coll. Ent. Soc. Philad. were thus diagnosed by their author, who instances a small and much paler variety with lateral metathoracic black lines not interrupted.

2. *Eiphosoma azteca*, Cress.

Proc. Acad. Philad. 1873, p. 381, ♂ ♀.

"Generally larger than *atrovittata*, which it resembles in the ornamentation of the anterior wings, but differs greatly in the color of posterior legs." Flavidous with black markings, including three mesonotal vittae, basal metathoracic transulcus and a line down its broad and somewhat deep median sulcus; hind femora unicolorous ferrugineous or with base and apex black, or in ♂ discally black throughout; tibiae and tarsi nearly entirely black; wings hyaline, with their apices sub-infumate; length, 6-7½ lines. Orizaba and Cordova, in Mexico. The British Museum possesses some dozen representatives of both sexes, found at Atoyac in Vera Cruz during May and at Teapa in Tabasco during February by H. H. Smith; in British Guiana in 1908 by J. Rodway; together with the ♀ from San Esteban in March, 1888, referred to by Marshall (Ann. Soc. Ent. France, 1892, p. 65), who records it also from near San Fernando, in Trinidad. Its distribution is, however, much broader than hitherto supposed, for two identical females were captured by Bates at Santarem on the Amazon and another a hundred miles off at Atta de Chia, on the Tapazos. A further ♀, also taken by Bates somewhere

on the Amazon in Brazil, differs from the type form exactly as *E. nigrovittatum* differs from *E. vitticolle*, in its total black of the areolet (var. *nulla*).

3. *Eiphosoma parana*, sp. n.

A very distinct species in its peculiarly dark coloration, the entire disc of the head, thorax except the red scutellar apex, and abdomen except the stramineous petiole, being black; as also are the entire hind legs, including calcaria, except the pale stramineous trochanterellus and femoral apices; the anterior legs are flavous; the thorax and abdomen both laterally broadly red; mesonotum sparsely and coarsely, scutellum closely and more finely, punctate; metanotal sulcus deeply impressed; terebra nearly half length of abdomen; areolet entire and not small. The typical female, and one other exactly like it but with no trace of areolet (var. *nulla*), were taken at Para on the Amazon in Brazil by Wallace and Bates, and acquired by the British Museum in 1848-9.

4. *Eiphosoma texana*, Cress.

Trans. American Ent. Soc. 1872, p. 176, ♀.

Black with numerous pale stramineous markings, including two mesonotal and four metanotal vittae; wings hyaline, areolet minute and petiolate; anterior legs whitish; hind femora white at both extremities, then black and centrally rufescent; their tibiae black with extreme base and a central band and calcaria white; length, $\frac{1}{2}$ inch. The type of this "very distinct species" was from Comal Co., Texas. Two males and three females in the British Museum were found by H. H. Smith in October at an altitude of 4,600 feet at Chilpancingo, and in both August and September at 6,000 feet at Amula in Guerrero; by Gaumer at Temex in north Yucatan; and by Schuman in July at San Blas in Jalisco. These Mexican males differ only sexually from Cresson's description and the females not at all, though the metathorax is occasionally only apically pale. Rev. T. A. Marshall took a specimen of the former sex in Trinidad; and E. E. Austen one of the latter on 12th March, 1896, as far south as Mosqueira on the Lower Amazon in Brazil.

5. *Eiphosoma annulatum*, Cress.

Proc. Ent. Soc. Philad. 1865, p. 54, ♀ ♂.

A flavous species with various black markings, including

"spot on posterior coxae, their trochanters, base of their (fulvous) femora, and their tibiae and tarsi . . . wings hyaline; areolet minute, petiolated;" length, 5 lines. Three examples of this Cuban species, said by Poey to be "parasitic upon a larva of *Pyralis*," were in coll. Ent. Soc. Philad. It appears confined to the West Indies and is not (I think) found on the mainland at all. H. H. Smith took a score of specimens, of which eight were correctly named by Ashmead (Trans. Ent. Soc., 1900, p. 271), on the Leeward side of the Mount Gay estate on Grenada; but most seem to have occurred with one so labelled in "Fitz-Hugh Valley, St. Vincent, 500 feet, in Cacao orchard, Sept. 30th," whence it is said (Journ. Linn. Soc. Zool. xxv, 1894, p. 58) to have been already recorded.

6. *Eiphosoma pyralidis*, Ashm.

Trans. American Ent. Soc. 1896, p. 191, ♂.

Black with numerous flavidous markings, including two central oval spots on front of mesonotum and "apex of metathorax connected with lateral lines not extending to the meta-scutellum"; hind femora red with their base and apex, and tibiae except centrally, black; wings hyaline, areolet subtriangular and petiolate; length, 12 mm. A single male from Kirkwood, Mo., labelled "Parasite on *Pyralid* (?) on Solidago, June 12, 1885." A female in the British Museum, found by Fruhstorfer at Theresopolis on 29th October, 1887, agrees perfectly with Ashmead's description of the male and has the terebra exerted 8 mm., to the insect's total length of 16 mm.

7. *Eiphosoma mexicana*, Cress.

Proc. Acad. Philad. 1873, p. 380, ♀; *Collyria nigrolineata*, Brullé, Nat. Hist. Hym. 1846, p. 178, ♀.

"This is larger than *vitticollis*, which it resembles by the wings being clear at tips; the body is more robust and the posterior femora differently coloured." Flavidous with black markings, including three broad mesonotal vittae, basal margin of the sparsely punctate metathorax and its deep, glabrous central sulcus; hind femora ferrugineous with their base, internally more broadly, black and the extreme apex white; wings hyaline; length, 9½-10 lines. Cordova in Mexico. But the hind femoral coloration is too variable to be reliable and I consider the mesonotal puncturation a better character. Cameron, whose figure (pl. xii, fig. 31) represents the ♂ more or less accurately, thought it not an uncommon

species and extends its distribution (Biol. Cent. Amer. 1886, p. 302) to San Geronimo in Guatemala, where G. C. Champion took the male. Later, Smith found females at Tepetlapa at 3,000 feet in Guerrero during October, at Atoyac in Vera Cruz in May, at Teapa in Tabasco in February and Gaumer at Temax in northern Yucatan. A very fine pair, extending to 22 mm., were secured near the mouth of the volcano of Orizaba in 1856 by M. Sallé, and are with the above in the British Museum. For the synonymy here of Brullé's species from Guyana, *cf.* Krieger in Zeits. Hym.-Dipt., 1903, p. 293.

8. *Eiphosoma vitticolle*, Cress.

Proc. Ent. Soc. Philad. 1865, p. 53, ♂ ♀; *Anomalon quadrilineatum*, Cam. Biol. Centr. Amer. 1886, p. 301, ♀.

"Yellow; antennae, three lines on mesothorax, a central one on metathorax, base and apex of posterior tibiae and their tarsi black, their femora fulvous; abdomen slightly tinged with fulvous, the narrow dorsal surface blackish; wings hyaline, areolet minute, oblique, petiolated . . . Readily distinguished from the preceding species (*X. atrovittatum*) by the metathorax having only a central black line, and by the different color of the hind legs;" length, 7 lines. Three Cuban examples in coll. Ent. Soc. Philad.; and at Proc. Acad. Philad. 1873, p. 381, its author further records it from Orizaba and Cordova in Mexico. The type of Cameron's very badly described *Anomalon quadrilineatum*, in the British Museum, is a typical female of the present species. This is by far the most abundant species of the genus and the British Museum has a very long series from Tierra Colorado at 2,000 feet in October; Rincon at 2,800 feet in October; Acaguizotla at 3,500 feet in October; Amula at 6,000 feet in August; Chilpancingo at 4,600 feet in August; Dos Arroyos at 1,000 feet in September; Atoyac in Vera Cruz during April and May; Teapa in Tabasco during January, February and March (all taken by H. H. Smith); Temax in north Yucatan (Gaumer); San Lorenzo in Cordova (M. Trujillo); and San Geronimo in Guatemala (Champion). Elsewhere its distribution is uncertain; a female in Marshall's collection is from Trinidad, and another was captured by Dr. Durham as far south as Para in Brazil about 1904. Kriechbaumer also received a number of specimens of this genus from South Brazil (Zeits. Hym.-Dipt. 1902, p. 361).

Var. *nigrovittatum*, Cress. Proc. Ent. Soc. Philad. 1865, p. 55, ♀.—This was originally supposed to differ from all the other species of its genus in its utter lack of alar areolet, since it was described from a single Cuban female with none;

but no doubt can remain from the evidence afforded by other species that this is not a good character in the present genus, especially since I have seen examples, undoubtedly referable to *E. vitticolle*, with distinct areolet in one wing and no trace of it in the other of the same individual. Half the fourteen specimens of the present form, in the British Museum, were taken at Atoyac in Vera Cruz during May by H. H. Smith; and others are from Teapa in Tabasco during February and March (*id.*) and Temax in North Yucatan (Gaumer).

NESANOMALON, gen. nov.

The whole conformation of the following species is so similar to that of *Eiphosoma* that no doubt respecting its position can be entertained; yet it differs too materially in the strong nervures of the hind wings which extend to their apices, in the exactly opposite and very strong nervellus, apically acute cubital cell, narrow and cylindrical thorax with no metanotal areae nor sulcus, in the shorter legs and abdominal segments, and in having the terebra strongly elongate, to be contained therein.

Like *Xiphosomella*, it is a form intermediate between the *Anomalides* and *Pristomerides*, with the stigma somewhat narrow. The only *Pristomerid* recorded from this region in Robert E. Brown's "Catalogue of Philippine Hymenoptera, with Descriptions of New Species," is a very different insect, *Pristomerus flavus*, Ashmead (Proc. U.S. Nat. Mus. XXVIII, 1905, p. 145, ♂), which was found in the garden of the Manila Observatory.

1. *Nesanomalon dimidiatum*, sp. n.

A slender species with the head, thorax and anterior legs dull fulvous, the abdomen with hind legs and the antennae black; wings strongly infumate but not nigrescent, with their base distinctly paler. Head not strongly constricted behind the prominent and not internally emarginate eyes; face and the convex, discreted clypeus distinctly and not closely punctate. Antennae filiform and pilose, extending to apex of second segment, with their extreme apices and the underside of scape rufescent. Thorax cylindrical and not broader than the head; mesonotum sparsely and obsoletely punctate, with notauli distinct but superficial; metathorax simple and nearly smooth, with an apical lateral carina only. Scutellum small and simple. Abdomen black, nitidulous and strongly compressed with the basal third of the first segment,

and the anus, nearly white; petiolar spiracles subcentral; terebra exactly as long as the body, with its spicula apically bisinuate and valvulae pilose. Legs not elongate, somewhat stout; hind tibiae basally curved, their femoral tooth neither small nor succeeded by denticulae; intermediate calcaria of unequal length. Wings ample and strongly infumate, with their base pale fulvescent; the strong nervures and normal-sized stigma black; basal nervure continuous through the median; parallel nervure emitted from centre of brachial cell; areolet wanting; the second recurrent emitted as far from basal cubital nervure as the latter is from the radial; all nervures of the hind wings strong; nervellus opposite and intercepted exactly at its centre. Length 13 mm.

A single female, captured on 10th May at Irisan in the Benquet Province of Luzon in the Philippine Islands, was presented to the British Museum in 1906, by R. C. McGregor.

XIPHOSOMELLA, Szépligeti.

Gen. Insect. Hym. 1905, p. 4.

An extremely distinct genus in lacking the submarginal, or intercubital, nervure and the transbicarinate metathorax; uniting the *Pristomerides* with their broad stigma to *Xiphosoma* with its narrow one—possessing the stigma of normal size and the hind femora dentate. One species, a representative of which has been in the British Museum for exactly fifty years, was described in 1905, and I here bring forward a second.

TABLE OF SPECIES.

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|-----|--|---------------------------------|
| (2) | 1. Hind femoral tooth strong; wings apically infumate; scape not pale. | 1. <i>brasiliensis</i> , Szépl. |
| (1) | 2. Hind femoral tooth weak; wings hyaline; scape entirely pale. | 2. <i>tabascensis</i> , sp. n. |

1. *Xiphosomella brasiliensis*, Szépl.

Gen. Insect. 1905, p. 4, ♀.

This beautiful species is extremely conspicuous in its bright red thorax, black abdomen, deeply and truncate infumate alar apices and lacking submarginal nervure; the stigma is much broader than in any *Xiphosoma* and the clearly delineated metanotal areae with strong costulae resemble that genus in no way. It should probably be transposed to the *Pristomerides*. Szépligeti knew a (? single)

female of 14 mm., with the terebra one third the length of body, from the Coary tributary of the Amazon in Brazil; and in the British Museum I have discovered a single male of 10 mm., differing only in sexual respects. This is simply labelled "Brazil," where it was captured on the Amazon, and subsequently purchased from Mr. Stevens, among other Hymenoptera from the private collection of H. W. Bates.

2. *Xiphosomella tabascensis*, sp. n.

A small red female of 9 mm., very slender and entirely rufescent with only the head except mouth, eyes, flagellum, abdominal disc, terebra and the hind tarsi, black. The structure of the meso- and meta-thorax, as well as of all the nervures, is as in the last species; but the wings are smaller and entirely hyaline with somewhat narrower stigma; the head, also, is smaller, with the eyes closer to each other and the mandibles flavidous; the hind femoral tooth is extremely small; the legs are more slender, and the hind ones have only the tarsi black; the abdomen is linear and discally black from base of second segment, and the terebra extends almost to the base of that segment. The type, in the British Museum, was captured together with two other similar females, at Teapa in Tabasco, during March, by H. H. Smith and presented by Messrs. Godman and Salvin, in 1904.

METANOMALON, gen. nov.

Eyes glabrous, strongly approximating apically and not internally emarginate; face constricted to the discreted and tuberculiform clypeus; frons trans-sulcate above the scrobes, with neither carina nor horæ. Antennae very slender and filiform, with the elongate flagellar joints cylindrical; scape pale, short and obliquely truncate. Thorax subpubescent; mesonotum entirely glabrous and very strongly nitidulous, with its central lobe elevated; notauli very deeply impressed and strongly crenulate; metathorax shining, sparsely sculptured, with distinct areae and its apex not produced; spiracles circular. Scutellum entirely glabrous and laterally margined to near its apex. Postpetiole not or hardly thicker than petiole; second segment centrally impressed, linear and double length of the third. Hind tarsi hardly at all explanate, calcaria longer than apical width of tibiae. Areolet sessile and subcomplete, its outer nervure weak and, in its lower half, obsolete but with the external cubital distinctly reflexed beyond the second recurrent nervure; stigma

distinct, though narrow; second recurrent emitted far beyond first submarginal nervure; anal emitted from but slightly above centre of first recurrent, which is distinctly before centre of first cubital cell; basal nervure continuous; nervellus strong, straight and not intercepted; neuriation of hind wings strong to apex. This genus is by no means typically Anomalid, and is here placed for lack of a more natural position; the areolet, glabrous mesonotum and scutellum, as well as the general paucity of sculpture, are entirely distinct.

1. *Metanomalon poliendum*, sp. n.

A black species with the mouth, scape, tegulae and front coxae, stramineous; metathorax entirely, mesopleurae and their sternum, anterior legs, hind coxae and their trochanters, basal half of first segment, with base of the third and fourth, and venter broadly, pale testaceous; hind legs infusate and more or less rufescent-marked. Metanotum subnitidulous and glabrous, with very sparse and fine puncturation, and complete though indistinct areae; basal area cordiform and twice longer than broad, areola subparallel-sided and also twice longer than broad, with the strong costulae emitted near its base; petiolar area finely reticulate and very distinctly discreted; length, 8 mm. ♂ only. The type, in my own collection, is from Kandy in Ceylon and was found by Mr. E. E. Green during June, 1907.

PODOGASTER, Brullé.

Hist. Nat. Ins. Hym. iv, 1846, 179.

The typical species of this misunderstood genus does not appear to have been mentioned in literature since first erected, but the original description and figure need but little emendation. In 1900, Ashmead placed this genus in the *Campoplegini* next after *Hyposoter*, Först., and here it was left by Dalla Torre the following year; but Szépligeti has very correctly transposed it to the *Anomalides* in 1905, though he evidently knew little but Brullé's account of it; for it is incorrect to say "Randmal fehlt" since, though narrow, it is distinct and in the Mexican species almost conspicuous. The genus is, in reality, very closely allied to *Trichomma* in its strongly pilose eyes and emarginate ♀ scutellum, though it is at once known by the subcontinuous anal nervure (excepting one species), the elongate antennae with their distinctly sinuate basal

flagellar joint, and entire nervellus, but "surtout à son métathorax globuleux, pourvu en arrière d'une pédicule allongé, sur lequel vient se fixer le premier segment de l'abdomen," as in *Trichomma producta*. I may add that, though the eyes are obviously hirsute in Brullé's species, this character is less distinct in the others here placed and those of the African representatives appear nearly or quite glabrous. I do not know Provancher's Canadian *Podogaster sulcatus* (Add. Faun. Canad. 1886, p. 90), nor his *P. radiolatus* (Nat. Canad. 1875, p. 329).

TABLE OF SPECIES.

- (8) 1. Parallel nervure continuous with median, or nearly so.
- (5) 2. Hind wing nervures apically wanting; alar apices infumate; anterior tibiae not white.
- (4) 3. Head transverse; parallel nervure not continuous.
 - 1. *coarctatus*, Brullé.
- (3) 4. Head buccate; parallel nervure continuous with median.
 - 2. *spilopterus*, sp. n.
- (2) 5. Hind wing nervures strong to apex; wings subhyaline; anterior tibiae white.
- (7) 6. Metathorax reticulate; face mainly black; anus black.
 - 3. *albiditarsus*, sp. n.
- (6) 7. Metathorax trans-strigose; face white; anus pale.
 - 4. *ruficaudatus*, sp. n.
- (1) 8. Parallel nervure by no means continuous with median.
 - 5. *africanus*, sp. n.

I *Podogaster coarctatus*, Brullé.

Hist. Nat. Hym. iv, 1846, 179, pl. xlii, figg. 6 et 6a, ♀; *P. striatus*, Cam., Proc. Manch. Soc. xxvi, 1887, p. 131, ♀.

Its author seems to have known but a single female, "Hab. la Guyane," probably from Cayenne. There is no subsequent record; and I know but a single pair, found by H. W. Bates in Brazil, "on the Amazon;" the ♀ is entirely typical, though the metathorax has only a supracoxal spot and the cauda is flavous. The ♂ is extremely similar, though differing in the unexpected features of antennae no longer than body, apical alar infumescence (applicable to front wings only) a little less determinate, the cubital nervure more curved, the intermediate femora nigrescent, the metathoracic apex immaculate and less produced, the scutellum black and—unlike the flavous and strongly bipartite ♀—deplanate and scabrous. In both sexes the hind tibiae are distinctly intumescent internally before their base. A female specimen in the British Museum, which appears to be the type of Cameron's *P. striatus* is

nothing but the present species with the metathorax more typically coloured than in the Batesian examples; *P. striatus*—"Hab. Amazons, Prof. J. W. H. Trail."

2. *Podogaster spilopterus*, sp. n.

A black species with the abdomen centrally, legs mainly, and the ♀ face with pro- and meso-thorax except mesosternum, red; wings hyaline with the apices of front ones determinately infumate. It differs from all the American species in its longitudinally sculptured mesonotum, shorter and stouter flagellum, the much less produced metathorax, as well as in the shorter terebra, the facial elongate griseous pilosity, and anal and cubital nervures exactly continuous with the median and first recurrent respectively; the metathorax is reticulate and centrally neither carinate nor sulcate, and the head is laterally parallel behind the eyes. Length, ♂♀, 14 mm. It is strongly allied to the American species in its curved basal flagellar joint. Both sexes were captured by Guy Marshall at Salisbury in Mashonaland during January and March, 1906, and are in the British Museum.

3. *Podogaster albiditarsus*, sp. n.

Very like *P. coarctatus*, but a little larger with the alar apices hardly at all infumate, the metathoracic cauda longer and pleurae convex, the anterior femora and all the legs basally black, the juxta-antennal orbits more broadly below and the mandibles pure white, as also are the front and middle tarsi except apically and their tibiae, with the apical two-thirds or two-fourths of the hind metatarsus and whole of their second to fourth joints; the abdomen is immaculate black and the wings narrower with the brachial cell (below cubital nervure) very much narrower, and the nervures of the hind wings strong to their apices. In the British Museum are three ♂♂ of this species, taken by Bates and labelled respectively "Brazil," "Para" and "Ega."

4. *Podogaster ruficaudatus*, sp. n.

Certainly not the other sex of the last species, though similar in the white anterior tibiae and tarsi, for the front femora are also concolorous below and the face with mouth entirely so; it further differs in its shorter antennae, trans-strigose and not reticulate metathorax which shows traces of

a triangular basal area, in a white and circular vertical dot and a dully concolorous basal streak beneath the hind metatarsi ; the wings are somewhat distinctly flavescent with their lower basal nervure more strongly postfurcal and the abdomen black with its venter and whole anus, including spicula and valvulae, bright fulvous. Two females in the British Museum taken by Smith during July at Omilteme in Guerrero, Mexico, at an altitude of 8,000 feet.

5. *Podogaster africanus*, sp. n.

A dull black species with only the face except centrally, clypeus except apically and mandibles, pale flavous ; antennae nearly as long as body and, except basally, fulvous ; legs, thorax and abdomen immaculate ; wings uniformly slightly infumate, with nervures of the hind ones strong to their apices ; the scutellum and metathorax rugose, with spiracles prominent and oval ; length, 16 mm. ; ♂ only. This species cannot be considered a typical *Podogaster* on account of its different neuration and lack of hind tibial intumescence ; but the distinctions are so slight as hardly to necessitate the erection of a new genus for its reception. The typical male was taken by S. A. Neave on the eastern slopes of the Aberdare Mountains in British East Africa in February, 1911, at an altitude of some 8,000 feet, and is in the British Museum.

TRICHOMMA, Wesmael.

Bull. Ac. Belg. xvi, 1849, p. 119.

Ashmead in 1900 revived the name *Theridium*, Curt., for this genus, since it was so termed by Förster (Verh. pr. Rheinl. xxv, p. 145) in 1868, though he did not know the reference. The latter's application is, however, entirely arbitrary and incorrect. The name *Therion* was published, with no description, by Curtis in his Guide of 1829, col. 101 (1837, col. 112) and is adopted *IN PLACE OF* *Anomalon*, Grav., in his Brit. Ent., pl. et fol. 736 (April, 1839), as he there explains : " Having published the genus *Anomalon* before Gravenhorst's work appeared, it may appear necessary to give my reasons for rejecting some of his names in the Guide. First *BASSUS* of Fabricius is Gravenhorst's third family *Cryptus*, seductorius being the type given in the Piezatorum ; secondly, Jurine's first family of *ANOMALON*, which of course is his type, Gravenhorst has called *Bassus* ; thirdly Jurine's second family of *Anomalon* I have called *THERION*, because it is not the typical *Anomalon*." The type of his genus *Therion* is *Ichneumon*

amictus, Fab. (S. E. 341), but he also catalogues, without description, species now referred to four or five different genera of *Anomalides*; and the only new species he brings forward was thought by Bridg.-Fitch in 1884 to be a variety of a Gravenhorstian species of *Anomalon*. If *Therion* can be adopted at all it must be *Schizoloma*, and not *Trichomma*, which falls.

The present genus comprises but few species, though these are widely distributed; Krieger in his monograph "Ueber die Ichneumonidgattung *Trichomma* Wesm." (Zeits. Hym.-Dip. 1904, pp. 162-172) recognises but five species. Those not treated of in the following table are *Trichomma clavipes*, p. 166, from New Guinea and *T. intermedia*, p. 168, which, occurs only in July at different localities in Saxony (Krieger Zeits. Hym.-Dip. iv.); *Trichomma cariniscutum* and *T. brevipenne*, Cam. (Ann. South African Museum, v, p. 88), from Cape Colony.

TABLE OF SPECIES.

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|------|--|------------------------------|
| (10) | 1. European species. | |
| (9) | 2. Face entirely punctate throughout; terebra black. | |
| (4) | 3. Body peculiarly slender; wings distinctly short | 1. <i>ruficoxis</i> , Först. |
| (3) | 4. Body and wings of normal proportions. | |
| (6) | 5. Scutellum pale-marked; clypeus apically rounded. | 2. <i>occisor</i> , Haberm. |
| (5) | 6. Scutellum often immaculate; clypeus apically dentate. | |
| (8) | 7. Clypeal tooth small; scutellum subsulcate; pleurae striate. | 3. <i>enecator</i> , Rossi. |
| (7) | 8. Clypeal tooth strong; scutellum bicarinate; pleurae punctate. | 4. <i>fulvidens</i> , Wesm. |
| (2) | 9. Face smooth; terebra basally red; clypeus rounded. | 5. <i>minuta</i> , Bridg. |
| (1) | 10. Extra-European species. African species. | 6. <i>albicoxa</i> , sp. n. |
| (12) | 11. American species; thorax mainly rufescent. | 7. <i>reticulata</i> Davis. |
| (11) | 12. Indian species; thorax not or obsoletely red-marked. | |
| (14) | 13. Metathorax hardly produced; scutellum convex, flavous. | 8. <i>nigricans</i> , Cam |
| (13) | 14. Metathorax elongately produced; scutellum flat, black. | 9. <i>productor</i> , sp. n. |

1. *Trichomma ruficoxis*, Först.

Verh. pr. Rheinl. 1860, p. 149, ♀.

This species is described (*l.c.*) as black, antennae infusate

with the underside of scape, face, orbits, disc of propleurae and scutellum, flavous; legs rufescent-testaceous with the hind trochanters, femoral base and tibial apices nigrescent; wings short and hyaline; abdomen red with the second segment and also disc and sides of the following more or less black, terebra elongate; length, 9 mm. One specimen found in the vicinity of Aix. This name were, perhaps, better sunk (as is done by Krieger, Zeits. Hym.-Dip., 1904, p. 164) as a synonym of *T. enecator*; the distinctions are not defined and Förster is a notorious species-splitter.

2. *Trichomma occisor*, Habermehl.

Deut. Ent. Zeit. iv, 1909, p. 568, ♀.

Described from five ♀♀ captured by its author in Germany, about Worms, in May and June, 1891-1900.

3. *Trichomma enecator*, Rossi.

Fauna Etrusca, 1790, 48.

This is the common European species, so often raised from Tortricid moths, and at once known by the size and subradical striae. Many Continental examples in the British Museum are from Germany: Ruthe bred it on 2nd August from a willow-feeding *Tortrix* larva, which he had found between the leaves during the preceding September; and Switzerland, where Bucheker took it at Zürich, Neuhof, &c., on *Populus tremula*.

4. *Trichomma fulvidens*, Wesm.

Bull. Ac. Brux. 1849, p. 138; *T. bituberculatum*, Schmied. Zeits. Hym.-Dip. 1902, p. 365, ♂.

One of the rarest of all palaearctic *Anomalides*; found only in Belgium, France and Germany (Saxony and Thuringia), where it evinces some predilection for blackberry bushes from the end of March to May, since Krieger took three females at Leipzig between 22nd and 30th May, both sexes on 17th April, 1898, and one male so early as 17th April, 1900. The single British female is in the British Museum. and was recorded by T. Desvignes in his Catalogue of 1856, p. 104. There, too, is a single Continental pair of 18 mm., of which the male was caught by Ruthe on 2nd May, 1849, and the ♀ bred from some *Tortrix*-pupa in Germany.

5. *Trichomma minuta*, Bridg.

Anomalon minutum, Bridg., Trans. Ent. Soc. 1884, p. 425; cf. Entom. 1884, p. 224; *Trichomma minutum*, Schm., Opusc. Ichn., p. 1463.

Little can be determined respecting the correct position of this species, of but 5 mm., till the type in the Norwich Castle Museum be re-examined; Krieger in 1904 thought it probably correctly assigned to the present genus.

6. *Trichomma albicoxa*, sp. n.

A small and very distinct black species, with the abdomen and hind femora broadly red in their centre; the face except in ♀ centrally, mouth and whole orbits, prothorax, anterior trochanters, and all the coxae except in ♀ base of the hind ones, stramineous; the remainder of the anterior legs, and the ♀ scutellum flavous; antennae filiform, about half length of the body and entirely black; wings hyaline and somewhat small; terebra straight, slender and fully half length of abdomen; length, 8-9 mm. In the British Museum is a pair, from Dr. Sharp's collection, taken by F. Muir at Durban in 1902, of which the female has the stigma conspicuous and the parallel nervure emitted but slightly above centre of brachial cell, while in the male it is exactly continuous with the median nervure and the stigma is sublinear; they are so analogous in all else but the scutellar colour, that I have no hesitation in regarding them as representing but the sexes of one species.

7. *Trichomma reticulata*, Davis.

Trans. American Ent. Soc. 1897, p. 361, ♀.

A remarkable insect, with the thorax mainly red and terebra half length of the body. A single female, taken in a swamp during July, came from the Michigan Agricultural College. It is detailed by Krieger (Zeits. Hym.-Dip. 1904, p. 171).

8. *Trichomma nigricans*, Cam.

Spolia Zeylanica 1905, p. 130, ♀.

I have seen both sexes of this fine species, which varies from 10-17 mm. (usually 15-16 mm.), and is most closely related to *T. enecator*, though nearly always much larger and black, with nitidulous and flavous scutellum and orbits. It is found in Ceylon from June to August with some frequency, and has been bred from a *Tineid* moth. Its range extends to the Khasi Hills of Assam, and to Dehra Dun in

the western Himalayas. Krieger in 1904 thought that *Anomalon decorum*, Cam., also probably belonged to the present genus.

9. *Trichomma productor*, sp. n.

A linear, black species with the face, orbits and hind tarsi alone flavous; legs and abdomen nearly entirely red; scutellum strongly deplanate and black; metanotum elongately produced above the petiole; length 14-15 mm. ♀ unknown. At once recognised from *T. nigricans* by the elongately produced metathorax and deplanate, black scutellum. It is described from a couple of males, taken at Mussoorie in the north-west provinces during October, 1906, at 7,000 feet; and is also represented thence in the Calcutta Museum.

SCHIZOLOMA, Wesm.

Bul. Ac. Brux. 1849, p. 118.

Known by the reflexed and bilobed clypeus and the emission of the first recurrent nervure from centre of the discocubital cell.

TABLE OF SPECIES.

- (4) 1. Wings very strongly infumate (New World).
- (3) 2. Notauli entirely wanting; scutellum black. 1. *confusa*, Ashm.
- (2) 3. Notauli strongly impressed; scutellum flavous.
2. *regalis*, sp. n.
- (1) 4. Wings hyaline or, at most, fulvescent (Old World).
- (6) 5. Vertical orbits immaculate; internal cubital emitted lower.
3. *amicta*, Fab.
- (5) 6. Vertical orbits flavous; internal cubital emitted higher from submarginal.
- (8) 7. Metanotal carinae radiating from its centre; ♂ head buccate.
4. *capitata*, Desv.
- (7) 8. Metanotal carinae forming areae; ♂ head normal.
5. *fulvicornis*, Cam.

1. *Schizoloma confusa*, Ashm.

Proc. U.S. Nat. Mus. 1889, p. 426, ♀.

A black species with concolorous wings and only the antennae, except basally, head and legs partly fulvidous-flavous; hind tibiae not flavous-marked and abdomen basally red; notauli wanting; length 27 mm. This female

from southern Carolina resembles *Exochilum morio* and *Heteropelma flavicorne* in its strikingly dark wings, with flavidous antennae and tarsi.

2. *Schizoloma regalis*, sp. n.

Very closely allied to the above, of which I should have considered it the other sex were it not that the notauli (Ashmead's "parapsidal furrows") are strongly and deeply impressed; otherwise it appears to differ only in the bright flavous scutellum, of which the "posterior portion" is not strongly elevated. I had some hesitation in placing the present species on account of the clypeal structure, which is apically acutely unidentate, but the tooth is distinctly reflexed and the labrum, as in Ashmead's female, is prominent. The typical male in the British Museum is from the Godman-Salvin Collection and was captured at an altitude of 6,000 feet by H. H. Smith during September at Amula in Guerrero, Mexico.

3. *Schizoloma amicta*, Fab.

Syst. Ent. 1775, 341, ♀.

Originally described from Britain, as shown by the type which is still in the British Museum (*cf.* my remarks, Entomologist 1909, p. 137). It seems commoner with us than upon the Continent, though its range extends as far east as India, whence are examples in the Oxford Museum.

4. *Schizoloma capitata*, Desv.

Cat. Ichn. Brit. Mus. 1856, 104, ♂; *S. bucephalum*, Brauns, Arch. Nat. Meckl. 1898, p. 71.

Very much rarer with us than the last species, but widely distributed and in Germany commoner than *S. amicta*. Brauns redescribed the ♂ under the name *S. bucephalum*, synonymised by Schmiedeknecht (Opusc. Ichn. 1463). The female is still considered everywhere rare, though doubtless mixed with the last.

5. *Schizoloma fulvicornis*, Cam.

Manch. Mem. 1899, p. 104, ♂ ♀.

Described from the Khasi Hills of Assam; and I have seen another female, taken by Maxwell Lefroy at Mussoorie in the United Provinces at an altitude of 7,500 feet during August, 1906.

HETEROPELMA, Wesm.

Bull. Ac. Brux. 1849, p. 119.

The neuriation is exactly as in the last genus ; but the hind tarsal structure distinguishes it from all other *Anomalid* genera.

TABLE OF SPECIES.

- | | | |
|------|---|------------------------------|
| (4) | 1. Wings strongly infumate throughout. | |
| (3) | 2. Body and legs black ; antennae flavous. | 1. <i>fulvicorne</i> , Say. |
| (2) | 3. Body and legs ferrugineous, with antennae darker. | 2. <i>datanae</i> , Riley. |
| (1) | 4. Wings hyaline, or at most flavescent. | |
| (6) | 5. Antennae not longer than head and thorax ; second recurrent continuous ; body short and stout. | 3. <i>sonorensis</i> , Cam. |
| (5) | 6. Antennae elongate ; recurrent not continuous with sub-marginal ; body slender. | |
| (10) | 7. Frons scabrous ; hind coxae and abdominal base red. | |
| (9) | 8. Scutellum entirely, and external orbits mainly, black. | 4. <i>calcator</i> , Wesm. |
| (8) | 9. Scutellum, and external orbits very broadly, flavous. | 5. <i>orbitalis</i> , sp. n. |
| (7) | 10. Frons reticulate ; hind coxae and abdomen black above. | |
| (12) | 11. Metanotum sulcate ; antennae length of body ; lower basal nervure vertical. | 6. <i>fulvitarse</i> , Cam. |
| (11) | 12. Metanotum not sulcate ; antennae about half body ; lower basal oblique. | |
| (14) | 13. Antennae and scutellum black ; first segment longer than metathorax. | 7. <i>perornatum</i> , Cam. |
| (13) | 14. Antennae and scutellum pale ; first segment shorter than metathorax. | 8. <i>nox</i> , sp. n. |

1. *Heteropelma fulvicorne*, Say.

West Quart. Rep. Cincinnati, 1823, p. 73.

I do not understand Say's description of the wing (in Leconte, Writings, 1869, p. 163) " tip of the superior wings, and tip of the interior margin of the inferior wings, broadly margined with blackish " ; Brullé in 1846 (p. 171) gives them as unicolorous, " alis fuscis . . . fortement enfumées, sans reflet violet " ; and Provancher (Faun. Canad. Hym. 1883, p. 355) terms those of the ♂ simply " très foncées." The pair in the British Museum from America (Fred. Smith coll. 1879) and New York (H. Edwards, 1889) have them unicolorous, as are those of a ♀ presented by the Hon. W. Rothschild in 1911 and taken in the Monacknock Mountains of New Hampshire during July, 1906.

2. *Heteropelma datanae*, Riley.

Insect Life 1888, p. 177, ♀.

Prof. Riley's capital account of "The Habits of *Thalessa* and *Tremex*" includes a description of this species, parasitic upon *Datana integerrima*, said to resemble greatly *Thalessa lunator*, Fab. It is ferrugineous-brown with the abdomen cupreous-black; from all other species it is known by its rufescent coloration and in having the antennae darker than the head and thorax, and the legs paler with basal hind tarsal joint fully five times longer than the second; the wings are uniformly dark fuliginous throughout; length, 25 mm. The British Museum possesses an old ♂—differing in no way from the ♀—of 27 mm. and a small ♀ of only 19 mm., received by Rev. T. A. Marshall from Riley, who took it in August, 1880.

3. *Heteropelma sonorensis*, Cam.

Biol. Centr. Amer. 1886, p. 298, ♀.

The type in the British Museum is more like an *Erigorgus* than *Heteropelma*, and has the first hind tarsal joint barely thrice longer than the second. The figure (*l.c.* pl. xii, fig. 30) is good but the antennae are too stout and short, the stigma is fulvous and it does not show the distinctly exerted terebra. It was captured in northern Sonora, in the north of Mexico, and no further example has come in with the numerous later collection from the same country.

4. *Heteropelma calcator*, Wesm.

Bul. Ac. Brux. 1849, p. 120; *H. reticulatum*, Cam.,
Manch. Mem. 1899, p. 110.

A common palaearctic species, of which examples from Zürich, München, and other German localities are in the British Museum. I have no hesitation in here synonymising *H. reticulatum*, Cam., from the Khasi Hills of Assam, since I can discover no feature that does not entirely coincide with Wesmaels insect, except "alis violaceis." I have seen two ♀♀ agreeing in all other respects with his diagnosis, which were captured at Margherita in Assam and in Sikkim; these have distinctly fulvescent wings.

5. *Heteropelma orbitalis*, sp. n.

A red species, with the head and thorax black; the former with the mouth, face, frontal orbits shortly and the external

very broadly throughout, flavous; the latter with the scutellum, postscutellum and tegulae, dull flavescent; the second abdominal segment and the anus are discally infusate; the legs immaculate and the wings hyaline; length, 18 mm. It agrees throughout with *H. calcator* in sculpture, though the coloration, especially that of the wings which are not at all fulvescent, renders it abundantly distinct. I have seen but a single male in the Genoa Civic Museum, which was taken in southern Burma at an altitude of some 500 metres in November, 1888.

6. *Heteropelma fulvitarse*, Cam.

Manch. Mem. 1899, p. 111, ♀.

Examples in the Oxford and Genoa Museums are from the Khasi Hills of Assam (Rothney) and Carin Cheba in southern Burma (Fea). Its range seems very broad for Wileman has presented one to the British Museum, found by him on 21st August, 1908, at an altitude of 7,300 feet at Arizan in Formosa.

7. *Heteropelma perornatum*, Cam

Journ. Str. Br. R. Asiatic Soc. 1902, p. 50, ♀.

Placed in *Anomalon* by Cameron, but a co-type in the British Museum from "Kuching, July 15th, 1899," has the hind metatarsus fully four times the length of its second joint. It is by no means synonymous with *A. tinctipenne*, Cam., as was anticipated by Szépligeti (Gen. Insect. xxxiv, 1905, p. 12). The type is said to be at Cambridge.

8. *Heteropelma nox*, sp. n.

Much more closely allied to *H. sonorensis* than to the Asiatic species, though materially differing in the antennal length, which is greater than that of half the body; it is a much more slender species, with the orbits less conspicuously pale, the scutellum smaller and centrally impressed, pleurae rufescent, and femora black. Head black and scabrously punctate with the face and its discreted orbits, and a determinate triangle at the vertical orbits, flavous; external orbits narrowly flavous and the cheeks red; thorax ferrugineous, with the meso- and meta-notum black; the scutellum, postscutellum and an internal dot on under side of scape flavous; abdomen red with the two basal segments short and, except apical, black above;

terebra hardly half length of first segment; legs clear stramineous with anterior coxae whitish, and disc of the intermediate femora infuscate; hind legs flavous with femora except basally, apical third of tibiae, trochanters mainly, and coxae except their red base, black; second recurrent nervure emitted far beyond the submarginal; length, 17 mm. ♀ only. The type was taken by H. H. Smith at Xucumanatlan in Guerrero, Mexico, at an altitude of 7,000 feet during July; and is in the British Museum.

EXOCHILUM, Wesm.

Bull. Ac. Brux. 1849, p. 119.

This genus has the first recurrent nervure emitted from the centre of the disco-cubital cell, as in the two last genera; but is at once known by the hind metatarsus being hardly longer than double its second joint and the clypeus not apically reflexed and bilobed.

TABLE OF SPECIES.

- (10) 1. Wings strongly nigrescent throughout.
- (9) 2. Head and thorax black; anterior coxae concolorous.
- (6) 3. Hind tibiae at most piceous; tarsi rufescent.
- (5) 4. Nearctic; four basal antennal joints black. 1. *tenuipes*, Nort.
- (4) 5. Asiatic; three basal antennal joints black. 2. *diabolus*, sp. n.
- (3) 6. Hind tibiae broadly clear red or flavous.
- (8) 7. Hind tibiae except apically, and tarsi, flavous. 3. *morio*, Fab.
- (7) 8. Hind tibiae except apical half, and tarsi, rufescent. 4. *acronyctae*, Ashm.
- (2) 9. Head and thorax brown; anterior legs all fulvidous. 5. *texanum*, Ashm.
- (1) 10. Wings fulvescent or infumate, not nigrescent.
- (14) 11. Wings "smoky yellow," with stigmal base often flavous.
- (13) 12. Stigma basally flavous; metanotum impressed; hind femora partly black. 6. *fuscipennis*, Nort.
- (12) 13. Stigma fulvous; metanotum not impressed; hind femora entirely red. 7. *chinense*, sp. n.
- (11) 14. Wings at most fulvescent; stigma unicolorous.
- (16) 15. Abdomen black, with only two basal segments red-marked. 8. *nigrum*, Prov.
- (15) 16. Abdomen but sparsely black-marked.
- (42) 17. Abdomen not mainly pure flavous.
- (23) 18. Submarginal nervure antefurcal; scutellum, and often hind femora, black.

- (22) 19. Scape not pale; internal orbits normal; abdomen black-marked.
- (21) 20. Notauli very strong; hind tibiae entirely black.
9. *australasiae*, sp. n.
- (20) 21. Notauli wanting; hind tibiae mainly flavidous
10. *brevicorne*, Grav.
- (19) 22. Scape flavidous-white; internal orbits elevated; abdomen entirely red.
11. *scaposum*, sp. n.
- (18) 23. Submarginal nervure opposite or scutellum pale; femora at least half red.
- (41) 24. Frons cristulate; scutellum not centrally impressed.
- (40) 25. Head buccate; scutellum convex; external orbits hardly pale.
- (35) 26. Scutellum normally convex; pleurae immaculate; length at most 23 mm.
- (30) 27. Antennae stout, pale and not longer than half body; scutellum mainly pale.
- (29) 28. Wings flavescent; nervellus intercepted above centre.
12. *circumflexum*, L.
- (28) 29. Wings clear hyaline; nervellus intercepted below centre.
13. *neglectum*, sp. n.
- (27) 30. Antennae slender, black and fully two-thirds length of body.
- (32) 31. Notauli distinct; metanotum sulcate; scutellum shining.
14. *sulcator*, sp. n.
- (31) 32. Notauli obsolete; metanotum not sulcate; scutellum dull and impressed.
- (34) 33. Metathorax strongly rugose and pilose; ♀ face laterally black.
15. *trichiosoma*, Cam.
- (33) 34. Metathorax evenly reticulate and subglabrous; face flavous.
16. *atrachiosoma*, sp. n.
- (26) 35. Scutellum pyramidal; pleurae often pale-marked; length at least 30 mm.
- (39) 36. Scutellum simply pyramidal; pleurae always red-marked; nervellus intercepted at or above centre.
- (38) 37. Abdomen slender; metatarsus pale; cubital nervure straight to the submarginal; wings flavescent. 17. *giganteum*, Grav.
- (37) 38. Abdomen stout; metatarsus half black; cubital nervure curved before submarginal; wings hyaline.
18. *robustum*, sp. n.
- (36) 39. Scutellum ultrapyramidal; pleurae not pale-marked; nervellus intercepted below centre. 19. *verticale*, sp. n.
- (25) 40. Head narrow; scutellum deplanate; external orbits flavous.
20. *orbitale*, sp. n.
- (24) 41. Frons cornute; scutellum longitudinally impressed.
21. *acheron*, sp. n.
- (17) 42. Abdomen pure flavous, with anus from fifth segment black.
22. *occidentale*, Cr.

1. *Exochilum tenuipes*, Norton.

Proc. Ent. Soc. Philad. 1863, p. 360, ♀.

A black species with wings concolorous, tarsi mainly red and the antennae, except basally, flavous; "legs slender, the two anterior pair rufous before"; hind tibiae at most piceous; length 1.04 inches. Scudder took two females in Connecticut and Massachusetts. Rothschild presented a female to the British Museum, from the Monacknock Mountains of New Hampshire in 1911.

2. *Exochilum diabolus*, sp. n.

This species resembles *E. tenuipes* to such an extent that I have experienced the greatest difficulty in distinguishing my species from Norton's description of the nearctic one. Only the scape and base of the laterally subsinuate first flagellar joint are black in place of the four or five basal antennal joints; and the tarsi are here much darker. The type is from Westwood's collection and is in the Oxford Museum, labelled simply "India."

3. *Exochilum morio*, Fab.

Spp. Ins. 1, 1781, p. 436, ♀: *Ophion mundus*, Say, Boston Journ. Nat. Hist. 1836, p. 239.

Deep black, with the wings infumate-violaceous; antennae except basally, hind tibiae except apically and their tarsi, flavidous-fulvous; "anterior pair of the feet yellowish before: intermediate pair with a line before and base of the tibiae yellowish"; length nearly an inch. Say remarks (Boston Journ. Nat. Hist. 1836, p. 239) upon the resemblance of his *Ophion mundus* from Indiana to *Ichneumon morio*, Fab., and differentiated it (Leconte, Writings II, 695) by the colour of the hind legs, which were not described by Fabricius because wanting from their tibial base in his type. "N. Eng., N.Y., Pa., Ia., Lake Sup., Mex. (St. Farg.)"—Norton, Proc. Ent. Soc. Philad. 1863, p. 360. A long series in the British Museum—including the type—is from North America (Marshall), from Reedville and Blue Hills in Massachusetts, White Mountains in New Hampshire, New York and Jalapa in Mexico (H. Edwards), Cordova in 1861 (Sallé), and many taken by H. H. Smith at Amula in Guerrero at 6000 feet, Orisaba in December, 1887, at Jaral in Grand Juato, at Omilteme at 8000 feet and at Xucumanatlan at 7000 feet, both in July.

I am able to record this species from Britain ; Mr. R. Burgess Sopp has kindly given me a fine ♀, which he captured at Bootle by Liverpool on 30th July, 1904 ; doubtless imported.

4. *Exochilum acronyctae*, Ashm.

Trans. American Ent. Soc. 1896, p. 190, ♀.

A large species of 26 mm., bred in California and Washington from *Acronycta lupina* and *A. hastilifera*. "This large and beautiful form is allied to *E. tenuipes*, Cress., and *E. mundum*, Say, from both of which it is separated by the different coloured legs and abdomen," i.e. "legs fulvous . . . coxae and apical two-thirds of posterior femora and nearly apical half of tibiae, black" ; abdomen black with second segment except discally, third and lateral basal mark on fourth rufescent.

5. *Exochilum texanum*, Ashm.

Trans. American Ent. Soc. 1890, p. 426, ♂.

Piceous and black-pubescent with the wings, abdomen except basally and most of the hind legs, black ; antennae except basally, hind tibiae except apically and their tarsi, flavidous-fulvous ; "anterior and middle legs reddish-yellow" ; length 19 mm. Ashmead knew only the type from Texas. *Exochilum petiolatum*, Davis (Tr. Amer. E. Soc. 1897, p. 356), from South Dakota, appears so similar that I hesitate to regard it as distinct, though the length is only 15 mm. *E. texanum* is represented in the British Museum by three females, differing from the male description only in their more extensive brick-red coloration and varying in size from 15 to 21 mm. ; they are from Orizaba in Mexico (Sallé, 1856) and Congress Springs in California (Edwards, 1892).

6. *Exochilum fuscipennis*, Norton.

Proc. Ent. Soc. Philad. 1863, p. 359, ♀.

A black species of 27 mm., with rufescent markings and the wings distinctly infumate, basally darker with the stigmal base flavous. The type, taken by Osten Sacken at Washington, was alone known to Cresson.

7. *Exochilum chinense*, sp. n.

So like the last species that I should have regarded it as the undescribed male sex were it not that the "basin

of metathorax, sharply defined " in that species, is here continuous with its lateral sculpture and but slightly impressed. The submarginal nervure is intercepted by the straight disco-cubital exactly at its centre; the nervellus is opposite, and intercepted slightly below its centre; the wings are infumate with the basal two-thirds flavidous-infumate; the legs and abdomen except the black hind coxae, apices of their tibiae and disc of the segment, are red; and both the scutellum and mesonotal marks are obscurely concolorous; the rufescent antennae extend to apex of the third segment, the metathorax is vertically subglobular and the anteriorly flavous head is narrower than the thorax; length 30 mm. A single male in the British Museum is labelled "Bred from *Saturnia pyretorum*, Westw., Hong Kong.—J. H. Watson."

8. *Exochilum nigrum*, Prov.

Nat. Canad. 1879, p. 1425; Faun. Canad. Hym. 1883, p. 356, ♂ ♀; *cf. l.c.* Add. 1886, p. 76.

9. *Exochilum australasiae*, sp. n.

A large and stout species, allied to *E. brevicorne* in the thoracic sculpture, excepting its deeply impressed notauli and the antennae which extend nearly to the anus; in general structure it approaches closest to *E. robustum*, especially in the slightly antemedial first recurrent nervure and basally black hind metatarsi. The recurrent is continuous with the submarginal nervure, and the median quite continuous through the latter. It is distinct from any Anomalid with which I am acquainted in its entirely black hind tibiae. The face, tegulae and juxta-antennal, though neither the vertical nor external orbits, are flavous; the metanotum strongly sulcate and carinately trans-striate, the hind coxae are black and femora entirely deep red; vertex and temples buccate; length, 28 mm. A single pair of this species has stood in the British Museum since 1854, when Morton Allport of Hobart presented them from "Van Dieman's Land."

11. *Exochilum scaposum*, sp. n.

Instantly known from every other species of the genus by its totally pale-flavous scape. The flagellum is infusate and two-thirds the length of the body; the head below scrobes and the juxta-antennal orbits are flavous, with vertical and external orbital lines and tegulae concolorous; the scutellum

is not impressed; the metanotum not concave, but apically produced; the legs and abdomen are both slender and clear red, with only the anterior tibiae and tarsi flavidous and the hind tibiae apically infusate; stigma dull fulvous, submarginal nervure intercepted at its centre and the nervellus distinctly above its centre; the two basal hind tarsal joints of ♂ distinctly spatuliform; length 18-19 mm. Probably not uncommon in Queensland, where G. and R. E. Turner took a good many from 1892 to 1909, in which year C. French found one in north-west Australia, pointing to a wide distribution.

12. *Exochilum circumflexum*, Linn.

Syst. Nat. 1758, 566; *Anomalon missouriense*, Cam., Manch. Mem. 1897, p. 26; *A. japonicum*, Cam., Entom. 1906, p. 98.

Given by Szépligeti, who is doubtless correct in synonymising *Anomalon unicolor*, Ratz. (Ichn. d. Forst. 1849, 87), so lately as 1905, only from Europe; but I have seen it from Assam, Simla and Mussoorie, whence Cameron (Manch. Mem. 1897, p. 26) described it as *Anomalon Missouriense*. Again he thought a Japanese specimen, now in the British Museum to be something new, and termed it *Anomalon japonicum*. I am not prepared to synonymise Viereck's *E. varicolor* (Trans. Amer. Ent. Soc. 1903, p. 90, ♂) with the Linnean species, though the identity appears very probable; more especially since two nearctic females, certainly referable to *E. circumflexum* in the British Museum, are from Hudson's Bay in 1844 (George Barnston) and North America in 1891 (Miss Phipson).

13. *Exochilum neglectum*, sp. n.

I cannot reconcile this insect with any of the descriptions of nearctic species; it is most closely related to *E. circumflexum*, but is smaller with the legs stouter and shorter, the wings not at all flavescent and the nervellus intercepted distinctly below its centre; the legs vary from red with only the hind tibiae apically black to having the hind legs mainly and the intermediate femora also black. It is best recognised by the evenly convex scutellum being subglabrous and shining between its sparse and deep punctures, by the buccate head of both sexes, their mainly red scutellum and by the often broadly rufescent head, meso- and meta-notum of the ♀ which has the antennae mainly red, while those of the ♂ are black with only the under side of scape, like its face, flavous. Four pairs, including the type, were taken about Hudson's Bay

in 1844, except a single male found by Redman in Nova Scotia about the same time; these are in the British Museum.

14. *Exochilum sulcator*, sp. n.

A single male is the only specimen I know of this distinct species, which is easily distinguished from its Australian allies in its deep notauli and metanotal sulcus, black scutellum and disc of scape. In all other respects it is only to be known from *E. trichiosoma* by its longer antennae which extend nearly to the anus, the more acute temples and but externally slightly explanate hind tarsal joints. It was captured in February, 1901, in Victoria by C. French and is in the British Museum.

15. *Exochilum trichiosoma*, Cam.

Entom. 1906, p. 182, ♀.

Head as broad as thorax; length 21-25 mm. The type from "Australia" is in the British Museum with four co-specific males from Van Dieman's Land in 1845 (R. Butler), Hobart in March, 1891 (J. J. Walker), and Victoria in February, 1901 (C. French).

16. *Exochilum atrichiosoma*, sp. n.

Extremely like the last species but clearly distinct in its smaller size of 16-18 mm., in the much more fully and coarsely reticulate metathorax, the pilosity of which is considerably sparser and finer, in the smaller head which is narrower than the thorax, with the anterior legs less clearly flavous and the face entirely concolorous in both sexes. Both species have the abdominal disc very narrowly rufescent from the second segment; and the point of interception of the submarginal by the disco-cubital nervure is variable. Several examples in the British Museum are from Champion Bay, Western Australia in 1868 and Victoria during 1885 taken by du Boulay; and again in the latter locality by French in 1901.

17. *Exochilum giganteum*, Grav.

Ichn. Europ. III, 1829, 647; *E. pyramidatus*, Thoms., Opusc. Ent. 1895, p. 2118.

Considered doubtfully different from *E. circumflexum*, but the distinct scutellar convexity renders it probably so, as also do the characters adopted by Thomson for his certainly

synonymous *E. pyramidatus*. In the British Museum are several from Germany (Ruthe), Italy (Leach), and Algeria (Parsudaki).

18. *Exochilum robustum*, sp. n.

Allied to *E. giganteum* in structure but with head, legs, and abdomen much stouter, the wings quite hyaline with nervures, costa and stigma piceous, and the disco-cubital nervure distinctly a little curved before the submarginal, the lower basal continuous and the nervellus intercepted at its centre; the metanotum is but sparsely pilose and almost regularly trans-striate, the flagellum black, the temples entirely pale and the basal half of the hind metatarsi abruptly black; hind tarsi of ♀ distinctly explanate with the second joint more than a third the length of the first. The mesonotum has elongate and triangular vittae anteriorly on either side, with anus and disc of second segment black; length, 21 mm. The type ♀, in the British Museum, is labelled "Australia" and a second female, which I cannot consider distinct (since it differs in nothing but in the reception of the second recurrent by the median more beyond the submarginal) and propose to term var. *transpositor*, was taken at Cumberland in New South Wales. In this species the first recurrent intercepts the disco-cubital a little before its centre, but the discoidal cell is narrower neither basally nor apically.

19. *Exochilum verticale*, sp. n.

A large ♀ of 29 mm., in the British Museum, taken about 1844 in the district of Hudson's Bay by George Barnston, has so remarkable a modification of the black scutellum as to merit specific rank. This resembles that of certain *Joppides*, since it is ultra-pyramidal and strongly rugose, rising vertically from the basal sulcus and subvertically before the equally elevated and cariniform postscutellum. In all other respects it differs from *E. giganteum* only in its more coarsely sculptured metathorax, denser mesonotal pilosity, immaculate pleurae and less geniculate nervellus with its higher interception.

20. *Exochilum orbitale*, sp. n.

A red species with the head and thorax, excepting the flavous mouth, face, frontal and very broad external orbits, tegulae and scutellum, black; head not posteriorly buccate and antennae slender and elongate; length, 22 mm. Both sexes of this species are too closely allied to *E. circumflexum* to need

a detailed description ; therefrom it differs in its more slender and elongate form, legs and antennae, in the posteriorly narrower head with its very conspicuous flavous external and vertical orbits, in the entirely pale frontal cristula and scape, in the deplanate scutellum and immaculate red hind femora and coxae. Carin Cheba in southern Burma (L. Fea, in coll. Genoa Civic Museum).

21. *Exochilum acheron*, sp. n.

A red species with only the thorax and part of head black ; face and clypeus, frontal, genal and centre of the external orbits, flavous in both sexes ; apical third of the antennae clear fulvous ; scutellum black ; only apical third of the hind tibiae black ; hind metatarsus fully double length of the second joint and both spatuliform ; wings subfulvescent ; basal nervure subcontinuous ; nervellus postfurcal and intercepted above its centre ; length, 20-24 mm. Closely allied to *E. signatum*, Grav., as regards its elongate pilosity, &c., but the abdomen is of no unusual brevity. I have seen several of both sexes from India, some in the British Museum (Captain Reid in 1855 and Mrs. Baly in 1851), and it extends to eastern China, Shanghai (Fortune in 1854) and Hong Kong (Bowring in 1861). One male from Shanghai, in the British Museum, is extremely curious in that it agrees in every way with the type, except in possessing the hind metatarsi fully four times the length of the second joint, which character if constant (and I cannot credit that it is, so exactly does it agree in all other respects with the typical form) would translate it to the genus *Heteropelma*.

22. *Exochilum occidentale*, Cress.

Proc. Acad. Philad. 1878, p. 366, ♀.

Remarkable for the pure flavous of its abdomen, which has the " basal two-thirds of upper edge of second segment, stripe on each side of fourth segment, and the following segments entirely black. Length, .70 inch." Oregon and Colorado.

MAGNIBUCCA, gen. nov.

Head posteriorly much broader than eyes ; with the vertex broad and basally margined ; occiput perpendicular and concave ; mandibular teeth strongly obtuse, with the lower somewhat the shorter ; eyes glabrous, internally parallel and not emarginate ; clypeus apically rounded and slightly, but

obtusely, produced centrally ; cheeks strongly buccate ; frons laterally convex and centrally very finely unicarinate. Notauli obsolete and superficial ; metathorax convex, with no carinae ; spiracles elongate, ovate and not small. Scutellum convex, large, apically subtruncate and laterally immarginate. Abdomen fully twice length of head and thorax ; basal segment glabrous and linear to its centre, thence gradually explanate to the subapical spiracles. Legs stout and not elongate ; hind tarsi distinctly spatuliform, with calcaria hardly longer than breadth of tibial apex. Wings not ample ; stigma distinct ; basal nervure subpostfurcal, with lower basal nervure strongly oblique ; first recurrent nervure emitted before centre of first cubital cell, which is apically strongly obtuse below ; second recurrent nervure continuous with the submarginal, more than half fenestrate ; anal nervure emitted far above centre of brachial cell ; nervellus strongly intercepted very slightly below its centre ; all nervures distinct to alar apices. Very distinct in its vertical and occipital structure, and the peculiar coloration, which approximates it to *Labrorychus amabilis*, Tosq., from Transcaspia.

1. *Magnibucca testacea*, sp. n.

A large, stout and entirely testaceous species, with only the ocelli and disc of the second segment black. Head and thorax coarsely punctate, with only the metanotum somewhat smoother. Antennae (fractae) testaceous and multiarticulate, with the thirty or forty basal flagellar joints cylindrical ; scape hardly excised. Wings distinctly flavescent with the radix, tegulae and stigma fulvous. Length, 23 mm. The type of this very remarkable insect was taken by M. Cameron at Bangalore in southern India ; it is in the Calcutta Museum, but in so bad a condition as to render the sex uncertain.

BARYLYPA, Först.

Verh pr. Rheinl. 1868, p. 146.

AFRICAN SPECIES.

1. *Barylypa bipartita*, sp. n.

I have had considerable difficulty in distinguishing this female from British *B. perspicillator*, Grav., which it exactly resembles in every way except in its much more densely and elongately pilose and more finely sculptured metathorax, the flavous scutellum which is only longitudinally black centrally, the rufescent terebral sheaths and red hind coxae ;

length 19 mm. The typical female, in the British Museum, was captured by C. H. Pead at Bloksberg near Johannesburg and presented in 1907.

2. *Barylypa xanthomelas*, Brullé.

Hist. Nat. Ins. Hym. iv, 1846, 173, ♀.

Very different from the above in its ferrugineous coloration and strongly punctate head, though the size is similar. "La deuxième nervure recurrenente aboutit à la nervure intercubitale" seems to place it in the present genus or *Ophionopsis*, Tosq. Described in M. Serville's collection from South Africa.

TABLE OF AUSTRALIAN SPECIES.

- | | |
|---|--------------------------------|
| (2) 1. Length 40 mm. ; Tasmania. | 3. <i>flavitarsis</i> , Brullé |
| (1) 2. Length at most 17 mm. ; Australia. | |
| (4) 3. Metathorax distinctly trans-striate ; clypeus apically rounded. | 4. <i>victoriana</i> , sp. n. |
| (3) 4. Metathorax not distinctly trans-striate ; clypeus apically sub-acuminate. | (<i>LAPHYCTES</i> , Först.). |
| (6) 5. Basal and second recurrent nervures quite continuous ; scutellum and thorax black. | 5. <i>trilineata</i> , Cam. |
| (5) 6. Basal and second recurrent nervures not continuous ; scutellum and part of thorax red. | 6. <i>perturbans</i> , sp. n. |

3. *Barylypa flavitarsis*, Brullé.

Hist. Nat. Ins. Hym. iv, 1846, 71, ♂.

"Le deuxième nervure recurrenente est sur la même ligne que la nervure intercubitale." The great size will distinguish this Tasmanian species.

4. *Barylypa victoriana*, sp. n.

At once known from the two following species by the distinctly trans-strigose metathorax which in the ♀ is, like its scutellum and temples, red ; both sexes are black with the abdomen except discally and in ♂ anally, and the legs except the apical two-thirds of the hind tibiae and basal half of their stout and stramineous tarsi, black ; notauli distinctly impressed ; face, mouth, a genal line, underside of scape entirely and the anterior legs, clear flavous ; antennae three-quarters the length of the body, which is 12-13 mm. A single pair was found by C. French in Victoria during February, 1901.

5. *Barylypa trilineata*, Cam.

Entom. 1906, p. 183, ♀.

Cameron referred to the right sub-genus the unique female of this species—" *Laphyctes ? trilineata* "—which he much too vaguely records from "Australia"; the type is in the British Museum.

6. *Barylypa perturbans*, sp. n.

Very like the last species, though certainly distinct in its half smaller size, finer sculpture, flavous cheeks, rufescent propleurae, scutellum, pleural sutures, postscutellum, frenum and metathoracic apex with its sternum; all the coxae and hind trochanters are pale; the antennae a little longer than half the body, and the abdomen immaculate fulvous throughout; length, 9 mm. The single male type was found, with *B. victoriana*, by French in February, 1901, in Victoria.

ANOMALON, Jurine.

(Sensu stricto, sed etiam *Aphanistes*, Först.)

The palaearctic representatives of this genus, as well as those of *Labrorychus* and *Agrypon*, are extremely sparse in the British Museum, and no remark upon them is requisite beyond the fact that they came almost exclusively from the German and Swiss collections of Ruthe (acquired 1859) and Bucheker (acquired 1881), containing single examples of such things as *Anomalon procerum* and *Habronyx heros*—of which *A. (Erigorgus) mirabile*, Desv. (Cat. 1856, 105; Bridg.-Fitch, Entom. 1884, p. 224, ♂), is nothing but a male example with the second recurrent nervure unusually near the base; its British origin is very doubtful, since no second specimen has yet occurred.

ASIATIC SPECIES.

I have seen so few of Cameron's species of this genus, and his descriptions are so inadequate in respect of neuration, that it is impossible to place them in Förster's subgenera; *A. apicate* is a *Labrorychus*; and doubtless the latter author would have erected a new genus—of equal stability with his *Pterocormus* (cf. Wieg. Arch. 1850, p. 72 et my Ichn. Brit. 1, 119)—for the first of the following species. Cameron's descriptions, unfortunately, preclude anything but a colour table.

- (2) 1. Wings extending only to apex of postpetiole.
1. *brachypterum*, Cam.
- (1) 2. Wings extending at least to centre of abdomen.
- (4) 3. Metathorax broadly red-marked; frons carinate.
2. *carinifrons*, Cam.
- (3) 4. Metathorax immaculate black.
- (6) 5. Radical callosities flavous.
3. *decorum*, Cam.
- (5) 6. Thorax entirely immaculate.
- (10) 7. Scutellum flavous.
- (9) 8. Hind tibiae broadly black
4. *tinctipenne*, Cam.
- (9) 8. Hind tibiae entirely red.
5. *apicate*, Cam.
- (7) 10. Scutellum not flavous.
6. *binghami*, Cam.

1. *Anomalon brachypterum*, Cam.

Manch. Mem. 1897, p. 25, ♂.

Trincomali in Ceylon (Col. Yerbury).

2. *Anomalon carinifrons*, Cam.

Manch. Mem. 1899, p. 113, ♀.

Found in the Khasi Hills of Assam by Rothney.

3. *Anomalon decorum*, Cam.

Manch. Mem. 1897, p. 24, ♀.

Trincomali in Ceylon (Col. Yerbury).

4. *Anomalon tinctipenne*, Cam.

l.c. p. 112, ♀; *cf.* Ann. Nat. Hist. xx, 1907, p. 14.

Found with the last. The broken type of this species, in the British Museum, shows very remarkable neuration: the median nervure runs straight to its junction with the internal cubital, which is strongly sinuate, and only extends to centre of first cubital cell; the second recurrent nervure above is four times further from apex of internal cubital than the latter is from the radial; nervellus subopposite and strongly intercepted a little below its centre. Though overlooked by Cameron, the frons is stoutly cornute, which feature combined with its pectinate claws places this species in the subgenus *Aphanistes*, Först.

5. *Anomalon apicate*, Cam.

Entom. 1905, p. 106, ♂.

This is an extremely slender insect with the nervellus distinctly intercepted and geniculate; it is closely allied to *Labrorychus clandestinus*, Grav., though the hind metatarsus is nearly or quite thrice longer than its next joint. The type is in Col. Nurse's collection, and was captured by him at Simla during September, 1898, and there is also there a second male, differing in no way, labelled by Cameron "*Anomalon leptogaster*, Cam., Type." Cameron, further, sent a female of this species to the British Museum, labelled "type," though he only described the male! It is a good species; I have also seen it from Mussoorie in the United Provinces (Mus. Calcutta et Pusa) and Shillong in Assam (La Touche).

6. *Anomalon binghami*, Cam.

Ann. Nat. Hist. xx, 1907, p. 14, ♂.

NORTH AMERICAN SPECIES.

For the purpose of determining the specimens in the British Museum, I have not found it necessary to tabulate all the nearctic species, which cannot be adequately done without an examination of typical specimens. Those brought forward by Edward Norton (Proc. Ent. Soc. Philad. 1863, pp. 360-364), in his "Catalogue of our Species of Ophion, Anomalon, Paniscus and Campoplex," among which I suspect a good deal of sexual synonymy, have been thrown into a rough table and other kinds added only when found needful for the present purpose.*

TABLE OF SPECIES.

- (32) 1. Antennae not longer than three-quarters of the body.
- (15) 2. Recurrent nervure intercepted above centre; antennae not half length of body.
- (6) 3. Wings hyaline, with their stigma piceous.
- (5) 4. Black; abdomen red with black and flavous markings
1. *curtum*, Norton.
- (4) 5. Rufescent, with very sparse black markings 2. *buccatum*, sp. n.
- (3) 6. Wings infumate, with their stigma nearly always rufescent.
- (10) 7. Black species, with their abdomen red.

* The type of *Anomalon fulvohirtum*, Cam. (Proc. Manch. Philos. Soc., xxvi, 1887, p. 132), in the British Museum from the Amazons, is a ♂ *Campoplegid*, closely allied to *Charops*, Holmgren, which certainly is not an *Anomalid* genus, as placed in 1905 by Szépligeti in Gen. Insect., solely on account of its lacking alar areolet.

2. *Anomalon buccatum*, sp. n.

A fulvidous-ferrugineous species with only the mandibular apices, eyes, interocellar region, second and basal fourth of first segments discally, and apices of the hind tibiae, black. In coloration and the capital conformation it strongly resembles *A. magum*, but the vertex is less nitidulous, the antennae much stouter and somewhat shorter than half body, the metathorax is evenly sculptured and not centrally sulcate, the anus is not infusate nor the basal segment curved, the hind legs are much stouter with tarsi shorter, and the wings are smaller with the discoidal cell more parallel-sided and less contracted basally; length 12 mm. ♀ only. The type, in the British Museum, was captured by H. H. Smith at Chilpancingo in Guerrero, Mexico, at 4,600 feet during October.

4. *Anomalon nigratum*, Norton.

Proc. Ent. Soc. Philad. 1863, p. 363, ♂.

A single example from Massachusetts was alone originally known, and the description of this so closely resembles a pair in the British Museum from Chilpancingo, in Guerrero, found in August and October at 4,600 feet, especially in the black and flavous—not at all red—legs, that I have but little hesitation in recording it from so much further south as Mexico. The only discrepancy is that in Norton's species the metathorax has the "sides of basin distinct," while here it is evenly sculptured throughout. The new female has the terebra shorter than the basal segment. Provancher's Ottawa species (Add. à la Hym. Faun. Canad. 1886, p. 80) seems to me very distinct in its apically rufescent thorax, sometimes flavous scutellum, etc.

8. *Anomalon relictum*, Fab.

Ent. Syst. Suppl. 1798, 236.

The type is not in the British Museum, but there is a pair received by the Rev. T. A. Marshall, from Prof. Riley—named by the former "*apicale*, Cresson"—and a single old female taken (probably by Doubleday) in Georgia.

9. *Anomalon fumipenne*, Cresson.

Proc. Acad. Philad. 1873, p. 379, ♀.

Cameron simply records this species in the Biologia Centr. Amer. on the authority of Cresson's female from Orizaba-

which lacked antennae. There is, however, in the Godman-Salvin collection, in the British Museum, another female with the antennae intact, subfiliform, ferrugineous throughout, and exactly two-thirds the length of the body. It was taken at Acaguizotla, in Guerrero, by H. H. Smith, at an altitude of 3,500 feet during October.

10. *Anomalon anale*, Say.

Contrib. Maclur. Lyc. Philad. II, 1828, 75.

In the Rev. T. A. Marshall's collection, in the British Museum, is a male of this species, correctly named by Prof. Riley, and taken on 18th June in the District of Columbia, Washington. It is a widely distributed species in Canada and the United States.

12. *Anomalon orbitale*, Cresson.

Trans. American Ent. Soc. 1872, p. 170, ♂.

The single ♀ in the British Museum differs from Cresson's ♂ description only in having the third and fourth segments, with the deflexed terebra entirely, red; the hind tarsal joints are short, with the metatarsus nearly four times the length of the second, pointing to affinity with *Heteropelma*. It was received by Rev. T. A. Marshall "from C. V. Riley, 1888: U.S. N. M. Acc.: Texas." Belfrage originally took three males there, and it appears unknown elsewhere.

15. *Anomalon guatemalenum*, Cam.

A. Guatemalenum, Cam., Biologia Centr. Amer. 1886, p. 300, ♀.

Cameron's description is accurate enough if one except "alis fere fumatis." The clypeus is apically subspicately produced; the metanotum is discally deplanate and strongly trans-striate, with definite indication of an irregular transcarina before its base, and its apex is subelongately produced; the terebra is under 3 mm. in length and shorter than the straight basal segment; only the hind onychii are nigrescent, their tibiae being unicolorous red. I do not understand his "wings slightly smoky, the apex much darker;" for in the type, in the British Museum, they are unusually ample and entirely hyaline, though slightly stained with dirt. The unique ♀ is from Purula, Vera Paz (Champion).

16. *Anomalon nigrorufum*, Norton.

Proc. Ent. Soc. Philad. 1863, p. 361, ♀.

A pair, agreeing in every way with the description of this species is in the British Museum. The ♂ resembles the ♀ exactly, and has (unlike that brought forward by Provancher at Add. Hym. Canad. 1886, p. 81) the flagellum dark piceous. They were found by H. H. Smith, apparently in company, at Omilteme, in Guerrero in July at an altitude of 8,000 feet. Another ♂, differing only in its mainly rufescent thorax, is from Xucumanatlan at 7,000 feet in July.

20. *Anomalon magum*, Cresson.

Proc. Acad. Philad. 1873, p. 377, ♂ ♀.

One female was taken at Chilpancingo, in Guerrero, at an altitude of 4,600 feet by H. H. Smith in July; and a second at Venta de Zopilote at 2,800 feet, in June. The metathorax is coarsely reticulate, but hardly rugose, with a narrow and parallel-sided crenulate central sulcus from its base to the produced, but not reflexed, apex.

TABLE OF AUSTRALIAN SPECIES.

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|-----|--|--------------------------------|
| (2) | 1. Metathorax finely rugose; basal half of hind metatarsi red, their coxae red. | 1. <i>coarctatum</i> , Brullé. |
| (1) | 2. Metathorax reticulate; basal third of hind metatarsi infusate, their coxae black. | 2. <i>variicolor</i> , sp. n. |

1. *Anomalon coarctatum*, Brullé.

Hist. Nat. Hym. iv, 1846, 176, ♀.

The neururation of the hind wings is not indicated by its author; but the fact that "la deuxième cellule discoïdale dépasse un peu la cellule moyenne" renders its inclusion in the present genus probably correct.

2. *Anomalon variicolor*, sp. n.

This is evidently closely allied to the last species, but it is distinct in too many details to be considered co-specific in the absence of the type. From Brullé's description it differs in having only the external and juxta-antennal orbits broadly flavous, the prothorax is entirely ferrugineous with metapleurae, margins of mesonotum and sutures of mesopleurae concolorous; the stigma is not paler below, the anterior legs are entirely flavous, and the hind coxae excepting a basal spot are black, their tarsi only infusate at their base; the

abdomen is very dull rufescent, and the terebra fulvidous ; length, 16 mm. One ♀ was found by Turner at an altitude of some eleven hundred feet during December, 1901, at Kuranda, about fifteen miles from Cairns on the Queensland coast.

SPILANOMALON, gen. nov.

The following species was placed in *Anomalon*, with a query, by Cresson, and it differs from the genus as defined by Gravenhorst and Wesmael in its strongly transverse head, prominent eyes, the obsoletely sculptured thorax and scutellum, entirely polished metathorax, less compressed abdomen which is not longer than the terebra, with deplanate and basally impressed three first segments ; in the very long hind coxae, and not incrassate tarsi ; but especially in the distance at which the recurrent nervure is emitted from the elongate submarginal nervure, and in the strongly curved radius. Superficially it is instantly recognised by the determinately infumate apices of the otherwise hyaline front wings, and by the, bright red body with sparse black markings.

1. *Spilanomalon elegans*, Cress.

Anomalon ? elegans, Cress., Proc. Acad. Philad. 1873, p. 379, ♀.

In the earlier researches of F. D. Godman into the fauna of Mexico, he took a single ♂ of this species at Orizaba in December, 1887. Subsequently H. H. Smith found it in some numbers at Teapa in Tabasco, during January, February, and March ; and there are a score of males, and half as many females, of this beautiful species in the British Museum. The male differs only in sexual characters from Cresson's description.

AGRYPON, Först.

Verh. pr. Rheinl. xvii, 1860, p. 151.

This genus is at once recognised by the total lack of any nervure emitted from the nervellus, and in this character agrees with the same author's genus *Atrometus* (cf. Perkins' four new Hawaiian species in *Fauna Hawaiiensis*, Suppl. 1910, pp. 681-3, two of which have the genus misspelled), which was regarded as distinct upon the feature of the anal or parallel nervure being emitted so high from the brachial cell as to be subcontinuous with the median ; this hardly constitutes generic rank, however, and I have treated both

under the present generic name. It is impossible to relegate *Anomalides*-species to their correct genera, since the authors have consistently failed to detail the neuriation; many of the kinds here treated of under *Anomalon* doubtless belong to the present genus, respecting the stability of which I am sceptical, and expect species here placed will for the most part be found nothing but weakly developed examples of those enumerated in other genera.

TABLE OF ASIATIC SPECIES.

- (2) 1. Tarsal claws very distinctly and closely pectinate. 1. *villosum*, Tosq.
- (1) 2. Tarsal claws simple and not at all pectinate.
- (12) 3. Clypeus not apically truncate; basal segment linear.
- (11) 4. Metanotum coarsely reticulate; face entirely pale.
- (6) 5. Antennae not longer than half body. 2. *flavifrons*, Smith.
- (5) 6. Antennae much longer than half body.
- (8) 7. Antennae longer than whole body. 3. *caliginosum*, Tosq.
- (7) 8. Antennae but slightly shorter than body.
- (10) 9. Frontal orbits pale; tarsi explanate; length 20 mm. 4. *nox*, sp. n.
- (9) 10. Frontal orbits black; tarsi normal; length 15 mm. 5. *variitarsum*, Wesm.
- (4) 11. Metanotum finely rugose; face only laterally pale. 6. *tisiphone*, sp. n.
- (3) 12. Clypeus apically truncate; postpetiole explanate. 7. *sumatrense*, Tosq.

1. *Agrypon villosum*, Tosq.

Mém. Soc. Ent. Belg. x, 1903, p. 31, ♀.

Described under the genus *Anomalon* from Si Rambé in Sumatra in December, but queried by its author as belonging to Förster's genus *Camposcopus*, which is distinct from both *Anomalon* and *Agrypon* in its pectinate claws, though agreeing with the latter in lacking nervellus nervure; Dalla Torre could find no species of it in 1901. This is an infusate testaceous female of 15 mm.

2. *Agrypon flavifrons*, Smith.

Anomalon flavifrons, Smith, Trans. Ent. Soc. 1874, p. 395, ♀ (*nec* Grav., Übers. 1807, p. 297).

So like the abundant palaearctic *A. flaveolatum*, Grav., that at first I failed to discover any distinction; only one can I see, which is in the ♀ hind tarsi; these are short, and

stout in the Japanese type, more slender and half their tibial length in the European species. The type, from Hiogo in southern Japan, is in the British Museum.

3. *Agrypon caliginosum*, Tosq.

Mém. Soc. Ent. Belg. x, 1903, p. 25, ♀.

The type was captured at Doreu-Hum, in New Guinea, during April, 1875, by Beccari, and is in the Genoa Museum.

4. *Agrypon nox*, sp. n.

Head black with the face, clypeus and mouth, the frontal and vertical orbits, and the whole cheeks externally, flavous; eyes entirely glabrous; frons with neither apical horn nor central carina. Antennae 14 mm. (body 20 mm.) in length, entirely infusate, with the scape alone flavous. Thorax not red-marked; mesonotum rugosely punctate and dull, black, not strongly convex, nor with its lateral carinae prominent. Abdomen red; its second segment discally black, and the anus somewhat infusate. Legs slender and red, with only the hind tibiae broadly black at their apices; front coxae transversely carinate; hind tibiae not basally constricted, their tarsi spatuliform. Wings with the first recurrent emitted far before centre of the first cubital cell; internal cubital nervure curved; second recurrent emitted beyond the submarginal nervure; nervellus strong, straight and not intercepted; the external nervure of hind wing not wanting; length, 16-20 mm. It appears to differ from *A. stenostigma*, Thoms., in little but the very distinctly transcarinate front coxae, which feature allies it more closely to *A. anxium*, Wesm.; it is, however, much larger than either. Probably not rare; the type is at Oxford. I have seen it from southern Burma, Mussoorie and Shillong in Assam.

5. *Agrypon variitarsum*, Wesm.

Bull. Ac. Brux. 1849, p. 131.

This common palaearctic species has been found with some degree of frequency throughout north-west India, at Abu in Rajputana (Col. Nurse), the north-west Provinces (Mrs. Holmes, in the British Museum), Margherita and Sadiya in Assam, and the Dawna Hills of Lower Burma (Calcutta Museum). A ♂, taken on the Maine coast of the United States of America by Danfurth in 1902, differs in no pertinent character and seems distinct from the three nearctic species described in 1890 and 1896 by Ashmead.

6. *Agrypon tisiphone*, sp. n.

Head black with only the internal orbits to above scrobes indeterminately stramineous, and the mouth with apex of clypeus transversely flavous; eyes entirely glabrous; frons centrally feebly carinate, with no horn. Antennae 12 mm. in length, entirely infusate, with the scape black throughout. Thorax neither red- nor flavous-marked; mesonotum transversely scabrous and very dull, with no notauli. Scutellum black and subconvex. Abdomen concolorous, with the third to fifth segments and the whole terebra fulvous. Anterior legs flavous with the onychii alone infusate; hind legs stouter and black, with only the femoral apices subbadious; front coxae not carinate; hind tibiae not basally constricted, their tarsi somewhat broad. Wings with the first recurrent emitted before centre of first cubital cell; internal cubital nervure curved; second recurrent emitted beyond submarginal nervure; nervellus strong, straight, and not intercepted; nervures of hind wings distinct to apex. Length, 12 mm. ♀ only. Allied to *A. anomelas*, Gr., but at once known therefrom by the elongate antennae and scabrous mesonotum. I have seen a couple of females of this species from Calcutta and from Kandy in Ceylon. where they occurred in June, 1909.

7. *Agrypon sumatrense*, Tosq.

"(?) *Anomalon sumatrensis*," Tosq., Mém. Soc. Ent. Belg. x, 1903, p. 28, ♀.

This unique female, taken at Pangherang-Pissang, in Sumatra, during the winter of 1890, is said to differ from all described Anomalid genera in the clypeal and petiolar structure, as well as in the form of the front wing cells, of which the radial is narrow and strongly elongate; it is most closely allied to *Atrometus*.

TABLE OF AFRICAN SPECIES.

- (2) 1. Basal nervure subcontinuous, lower basal straight; thorax red.
1. *primum*, sp. n.
(1) 2. Lower basal nervure strongly postfurcal and curved; thorax
black. 2. *secundum*, sp. n.

1. *Agrypon primum*, sp. n.

A dull and coarsely punctate, ferrugineous species, with the antennae, eyes, vertex, meso- and meta-sternum, hind coxae, disc of abdomen basally, of the hind femora and their tarsi, alone black; the entire face, clypeus, mouth, outer orbits narrowly and underside of the scape, stramineous; face and

metathorax elongately white-pilose, the latter rugose with a very slight central sulcus; antennae as long as body, attenuate and not very slender; terebra infusate and hardly longer than half basal segment, which is barely two-thirds the length of the second; wings hyaline and normal with the parallel nervure emitted far above centre of brachial cell; length, 14 mm. ♀ only. The typical female was collected by S. A. Neave in April, 1911, at an altitude of 3,000 feet at Kibwezi, in British East Africa, and was presented to the British Museum by the African Entomological Research Committee.

2. *Agrypon secundum*, sp. n.

A shining and finely punctate, black species with the anterior legs and the abdomen, except their bases, red; head, underside of scape, anterior coxae and trochanters, pale stramineous with the vertex except orbital dots, frons and occiput black; face and metathorax elongately white-pilose, the latter scabriculous with no central sulcus; antennae fully three-quarters the length of the body, filiform and not very slender; terebra fulvous and hardly half length of basal segment, which is almost as long as the second; wings hyaline and normal, with the parallel nervure emitted somewhat above centre of brachial cell; length, 14 mm. ♀ only. The only known female, in the British Museum, is from Dr. Sharp's collection, and was taken at Durban in 1902 by F. Muir.

TABLE OF AUSTRALIAN SPECIES.

- (2) 1. Brick-red; antennae as long as the body; face scabriculous. 1. *ferrugineum*, sp. n.
(1) 2. Black and red; antennae three-quarters the length of body; face nitidulous. 2. *melanura*, sp. n.

1. *Agrypon ferrugineum*, sp. n.

A nearly unicolorous brick-red species, with the posteriorly subbuccate head and base of anterior legs but slightly paler; eyes, ocellar region, mandibular apices, antennae except basally, hind tarsi and apical half of their tibiae, alone black; second segment and anus discally subinfusate; wings broad but not long, slightly flavescent, with lower basal nervure a little postfurcal; head and thorax coarsely reticulate; scutellum roughly punctate and circumcarinate; metathorax strongly produced apically, with its apical half centrally sulcate; length, 14 mm. ♂ only. The typical male was captured about Mackay in Queensland by Turner, who presented it to the British Museum in 1909.

2. *Agrypon melanura*, sp. n.

A small, dull black species with the legs and abdomen mainly bright red. Head subcubical but not posteriorly buccate, with the face strongly constricted apically at least in ♂, the frontal and external orbits, with a conspicuous vertical dot, stramineous; mouth and base of anterior legs concolorous; abdomen with the second segment discally and all abdominal segments from the fifth in ♂, and fourth in ♀, deep black; legs with the hind tarsi, their tibiae except before their base, and the extreme apices of their femora, black; terebra a little longer than half abdomen; length, 9 mm. ♂ ♀. A single pair of this distinct species, in the British Museum, was taken by French during February, 1901, in Victoria.

TABLE OF CENTRAL AMERICAN SPECIES.

- (4) 1. Parallel nervure not continuous with the median; scutellum centrally impressed.
- (3) 2. Basal segment very strongly curved, reflexed at both ends.
1. *sclerosum*, Cress.
- (2) 3. Basal segment entirely straight throughout. 2. *lineiger*, sp. n.
- (1) 4. Parallel nervure continuous with median (*ATROMETUS*); scutellum convex.
- (8) 5. Notauli and apophyses wanting; metanotum simple.
- (7) 6. Black markings very extensive; length 12 mm.
3. *residuum*, Cress.
- (6) 7. Vertex and the eyes alone black; length 7 mm.
4. *flaviceps*, Cam.
- (5) 8. Notauli and apophyses strong; metanotum transcarinate.
5. *flavopictum*, Ashm.

1. *Agrypon sclerosum*, Cress.

Proc. Acad. Philad. 1873, p. 378, ♂ ♀.

Cresson's blunt descriptions are excellent, but Förster's 1868 paper was little known in America, till too much eulogized by Ashmead. This species is an *Agrypon*, though described as an *Anomalon*, with the cheeks enormously buccate and the strong nervellus not at all intercepted; basal segment strongly curved upwards at both its extremities. Both sexes were described from Orizaba, and the British Museum contains a series of eleven examples found by H. H. Smith at Teapa in Tabasco during February and March.

2. *Agrypon lineiger*, sp. n.

A female in the British Museum differs from the last species in its subcubical head, which is far less acuminate below the

eyes, and in its coloration; the neurulation and structure, both corporeal and antennal, are identical. Head bright flavous with the whole antennae, frons from scrobes to vertex (excepting orbits) and whole occiput, black; thorax black with metathorax except basally below, the postscutellum, sides of scutellum and radicles red; abdomen red, with disc of all the segments black, and the basal segment straight; legs red with anterior coxae and trochanters, the second and third with apical third of the fourth and apical fourth of the first hind tarsal joints, flavous; remainder of hind tarsi, their coxae, trochanters, extreme base of tibiae and disc of femora, black; length, 11 mm., ♀ only. Taken by Smith on the Sierra de las Aguas Escondidas in Guerrero, at an altitude of 9,500 feet during July. An analogous female, though of 16 mm. with the hind metatarsi, scutellum and postscutellum flavous throughout (which I will term *postscutellaris*, var. nov.), was also found by him at Omilteme in Guerrero, Mexico, at 8,000 feet during August.

3. *Agrypon residuum*, Cress.

Proc. Acad. Philad. 1873, p. 378, ♀.

A single male, bearing a MS. name of Cameron in the British Museum, differs from *A. scelerosum* in a very few, but essential, points. The antennae are more slender and as long as the body, the temples behind the eyes are distinctly less buccate, the mesonotum is entirely black with the head basally black beneath, the scutellum is convex and not centrally impressed, the basal segment is not reflexed but subinflexed apically, the hind legs are entirely red with only the trochanters infuscate; and, moreover, the parallel nervure is emitted so high from the first recurrent as to place the species in Förster's subgenus *Atrometus*. I have no doubt it is the male sex of Cresson's species, in spite of the mesonotal colour. It was found by Godman at Orizaba during December, 1887.

4. *Agrypon flaviceps*, Cam.

Trans. American Ent. Soc. xxxi, 1905, p. 379, ♀.

The type of this species, brought forward in "Descriptions of New Species of Neotropical Hymenoptera," is in the British Museum, from "Mexico." It is distinct from any of Cresson's species thence, but I have not compared it with the northern nearctic species.

5. *Agrypon flavopictum*, Ashm.

Trans. Ent. Soc. 1900, p. 271, ♂.

Its length—really 8-10 mm.—is the only feature, except colour, contained in Ashmead's description and no comparison is made with any of the fifty north American species of *Anomalon*. In reality, Ashmead's male is worthy of generic rank on account of the overlooked notauli which are extremely deeply impressed and discally coalesced, of the peculiar lateral reflection of the prothorax, of the very strong frontal horn, exactly continuous basal with the lower basal nervure and parallel with the median nervure, first recurrent with the cubital and the subcontinuous disco-cubital with both the external radial and external cubital, since the submarginal nervure is so short as to be obsolete; the nervures of the hind wing are not complete to apex; and on account of the very strong transcarina before the base of the metanotum, with its excavate petiolar area, flanked by strong apophyses. The abdomen and legs are simple with hind tibiae basally curved, and their inner calcaria fully half the length of the not explanate metatarsus and about double the length of the outer. Antennae hardly longer than half the body, filiform and basally subattenuate. Only two or three ♂♂, from the Mount Gay estate on the Leeward side of Grenada, are in the British Museum. The ♀ is still unknown.

PARANIA, gen. nov.

Head posteriorly buccate, clypeus not discreted but apically subacuminate and not reflexed, mandibular teeth unequal in length and not slender; eyes internally not or hardly emarginate, apically convergent. Antennae slender, filiform and shorter than body. Thorax rugose or mainly smooth; metathorax longitudinally sulcate and transcostate throughout, with areae distinct and spiracles sublinear. Scutellum circumcarinate. Abdomen petiolate and a little compressed, with spiracles beyond centre of first segment. Legs slender and not elongate, front tibiae unicalcarate, posterior bicalcarate; claws subpectinate. Wings short and small, with neither glabrous areae nor corneous marks; second recurrent emitted from cubital beyond submarginal nervure; nervellus entirely wanting.

I have already pointed out (Revis. Ichn. Brit. Mus. I, p. 68) that *Nototrachys* is so naturally allied to *Ophion* through *Ophionopterus* and *Trachyopterus* as scarcely to merit tribal rank. Here I must repeat the same remark upon its

relationship with the Anomalides through *Pharsalia* and the present genus, which differs from it solely in its subacuminate clypeus, somewhat more distinct area on metanotum, bicalcarate intermediate tibiae and in the position of the second recurrent nervure; while superficially the resemblance is remarkable. Were the order here adopted of the Anomalid genera reversed, the natural sequence from *Euryophion* to *Podogaster* and *Metanomalon* would pass imperceptibly through the present and above-named genera. Close to *Parania*, though certainly not synonymous with it, must be placed *Clatha*, Cam. (*Spolia Zeylanica* 1905, p. 129), said to differ from *Agrypon* in the apically obsolete nervures of the hind wings; only a unique and broken specimen of its single species (*C. longipes*, Cam., l.c., p. 130) from Kandy in Ceylon, is known.

1. *Parania nototrachoides*, Morl.

A dull ferrugineous species with the face, mouth parts, orbits except vertically broadly, tegulae, anterior legs except their rufescent femora, and base of both hind tibiae and tarsi with their calcaria, conspicuously citrinous; remainder of hind tibiae, the antennae, scutellar region, hind trochanters with their tarsal joints except basally and both centre and apex of their tibiae, black. The metathorax is reticulate with its centre distinctly bicarinate and apex strongly produced over the apically subintumescent first segment, the second discally and anus are hardly infusate. Wings hyaline, with stigma narrow and piceous; second recurrent unifenestrate and emitted distinctly beyond the submarginal; cubital nervure exactly or almost exactly continuous with first recurrent, and the anal or parallel with the median; lower basal nervure a little postfurcal; nervellus entirely wanting, and all nervures of hind wing apically obsolete. Length 9-10 mm. ♂ only. In 1905, Mr. E. Dukinfield-Jones presented ten males of this interesting insect to the British Museum, which he had captured at Castro, Parana, in south Brazil; no female was taken, though I am strongly of the opinion that a bodyless specimen found on 23rd September, 1887, little more than 200 miles away, at Theresopolis by Frühstorfer, represents that sex.

HYMENOPHARSALIA, n. n.

Pharsalia, Cress., Trans. American Ent. Soc. 1872, p. 177.

I change Cresson's name for this genus here, because I am loath to credit the synonymy of *Ophionellus*, Westwood,

Purchased of Mr. Belfrage, *per* Mr. McLachlan ; November 1st, 1872." This I presume to be the type. With it I have placed a second of the same sex from the Godman-Salvin collection 1904, captured at Temax in northern Yucatan by Gaumer.

2. *Hymenopharsalia virginienensis*, Cress.

Pharsalia virginienensis, Cress., *l.c.*, ♂; *P. albofacialis*, Cam., Biol. Centr. Amer. Hym. i, 1900, pl. xvii, fig. 15, ♀; *cf.* p. 473.

"In the collection of the American Entomological Society there is another species belonging to this genus, from West Virginia, which I have named *P. virginienensis*. . . . It is a ♂," says Cresson. This male is possessed of a peculiar elongate style and has the face pale centrally and apically black, whereas in the ♀ it and the mouth are unicolorous stramineous, with the terebra a little longer than the former. This species seems common about Teapa in Tabasco, Mexico, where H. H. Smith captured the half dozen in the British Museum, during January and March. The abdominal incisures are rarely rufescent, as is instanced by an otherwise entirely typical male, taken in 1905 as far south as Castro in Parana, southern Brazil, by E. Dukinfield-Jones. I should have been inclined to here entirely synonymise *Ophionellus fragilis*, Westw. (Thesaur. 1874, 128, pl. xxiv, fig. 3, ♀) from the Amazon and Brazil, in consideration of the above southern capture, were it not that he gives the length at 10 lines, to Cresson's ".50 inch," or 13 mm. only.

3. *Hymenopharsalia mexicana*, sp. n.

A single ♀, captured with the above *H. virginienensis*, at Teapa in Mexico during March by Smith, must be considered distinct on account of its much stouter antennae which are broadly white-banded at their centre and have the scape and mouth entirely bright and pale orange; the face is immaculate black and the head very much broader than the thorax. Type in the British Museum.

SUB-FAMILY OPHIONINAE.

TRIBE PANISCIDES.

A tribe of flavidous or rufescent Ophioninae, usually of somewhat large size. Thorax nitidulous and never strongly sculptured; notauli distinct, but rarely deeply impressed; metathorax subdeclived throughout and not apically produced above hind coxae. Abdomen slender and not deplanate; basal segment elongate and subparallel-sided, rarely subpetiolate or subsessile, with the spiracles always before its centre and lateral sulci of unique conformation (termed by some modern authors glymmae); terebra shortly exerted or subconcealed, ♂ valvulae large and strongly exerted. Tarsal claws nearly always strongly pectinate; intermediate tibiae distinctly bicalcarate. Wings very ample; areolet very rarely wanting, usually triangular or obliquely rhomboidal, with the nervures subentire (the external often fenestrate below) and always coalescent above, emitting the external abscissa of the radius in a strong curve, which basally forms an acute angle with the internal abscissa of radius and is exactly continuous with the inner nervure of areolet; stigma never broad nor triangular, often pale; nervellus intercepted above, very rarely at or below, its centre. Known from remainder of the Ophioninae by having the external radius continuous at the base with the inner submarginal nervure.

TABLE OF GENERA.

- | | | |
|-----|---|--------------------------------|
| (8) | 1. Cheeks and temples normal; scutellum normal and basally carinate on either side. | |
| (7) | 2. All the tarsi pectinate; areolet entire or nearly so. | |
| (6) | 3. Spiracles of basal segment distinctly before centre; areolet triangular. | |
| (5) | 4. Lower much further from base than upper basal nervure. | PANISCUS, Grav. |
| (4) | 5. Basal nervure continuous through median nervure. | PARABATUS, Thoms. |
| (3) | 6. Spiracles of basal segment central; areolet quadrate. | TETRAGONALYS, Morl., gen. nov. |

- (2) 7. Tarsi simple ; areolet wanting ; petiolar spiracles central.
PARCA, Morf., gen. nov.
- (1) 8. Cheeks and temples buccate ; scutellum convex and not carinate.
- (10) 9. Claws strongly pectinate ; petiole with no membrane.
OPHELTES, Holmgr.
- (9) 10. Claws simple ; petiolar membrane laterally explanate.
WESTWOODIA, Brullé.

PANISCUS, Gravenhorst.

Ichn. Europ. III, 1829, 622.*

"A genus extensively distributed over the globe, but not containing many species," writes Cameron in 1886 (Biol. Centr. Amer. 302) ; but since that time the known species have been greatly augmented and the present enumeration will show how many we may yet expect when this family of insects is better worked. Subgenera will doubtless ere long be erected to somewhat relieve the number now to be considered under this name ; and these will find good foundation upon such features as the complete metathoracic transcarina of certain Australian and South American species, such as *P. diversus*, etc. The Braconid genus *Xiphozele* seems to be a freak of *Paniscus* in its single species, *X. compressiventris*, Cam., from Sikkim, of which the type is in the British Museum, and I have seen a second female, taken by Mr. Comber at Gairiappa on 8th June, 1907. There is no need to refer here to the extremely interesting economy of this genus, so well observed by George Newport, Prof. Poulton, Miss Kingsford, Adler and others.

TABLE OF AMERICAN SPECIES.

- (44) 1. Scutellum and abdomen not black.
- (3) 2. Head, thorax and anterior legs pale stramineous.
1. *semirufus*, Holmgr.
- (2) 3. Whole body subunicolorous testaceous.
- (25) 4. Ocellar region not or rarely infusate ; mesopleurae dull and closely punctate.

* Modern authors ascribe this genus to Schrank. Holmgren, Kirchner, Förster, Brischke, Thomson and Ashmead, however, all consider it originated with Gravenhorst. I can discover no earlier mention of Schrank as its author than Marshall's reference in his 1872 Catalogue of British Hymenoptera, p. 53 "Schr. F. B. ii, 311, note (1802)"; and Dalla Torre in 1901, followed by Schmiedeknecht, gives "Schrank, Fauna Boica II. P. 2, 1802, p. 316." At a recent suggestion from Herr Pfankuch, I have searched both these and other pages of Schrank's work in vain for *Paniscus*.

- (24) 5. Head and thorax not white marked.
 (9) 6. Nervellus nearly as far from basal nervure as it is long.
 (8) 7. Rufescent-flavous ; length 22 mm. 2. *brasiliensis*, Szépl.
 (7) 8. Stramineous-testaceous ; length about 17 mm. 3. *geminatus*, Say. ✓
 (6) 9. Nervellus but slightly postfurcal.
 (11) 10. Median nervure apically curved ; metanotal carina entire. 4. *gerlingi*, Schrot.
 (10) 11. Median nervure not curved ; metanotal apophyses alone prominent.
 (23) 12. Metanotum trans-sculptured or glabrous.
 (18) 13. Ramellus wanting or at most punctiform ; body and stigma testaceous.
 (15) 14. Temples as broad as eyes ; antennae shorter than body ; ocelli far apart. 5. *nodulosus*, sp. n.
 (14) 15. Temples narrower than eyes ; antennae as long as body ; ocelli approximate.
 (17) 16. Smaller ; head posteriorly narrow ; body fulvous. 6. *opaculus*, Thoms. ✓
 (16) 17. Larger ; head posteriorly broader ; body dark testaceous. 7. *rufus*, Brullé.
 (13) 18. Ramellus short but distinct ; body and stigma usually ferrugineous.
 (22) 19. Ocelli contiguous with the eyes ; stigma ferrugineous.
 (21) 20. Metanotum dull and strongly transaciculate ; length 20 mm. 8. *ignotus*, sp. n.
 (20) 21. Metanotum smooth with no carinae ; length 12 mm. 9. *medius*, Ashm.
 (19) 22. Ocelli not contiguous with eyes ; stigma flavous. 10. *alaskensis*, Ashm. ✓
 (12) 23. Metanotum evenly and subrugosely coriaceous, not trans-sculptured. 11. *immaculatus*, sp. n. ✓
 (5) 24. Head and thorax clear white-marked ; ocelli not approximate. 12. *albovariegatus*, Prov.
 (4) 25. Ocellar region nigrescent or black ; mesopleurae usually nitidulous and subglabrous.
 (27) 26. Hind tarsi clear white-marked ; ocelli closely approximate. 13. *albotarsus*, Prov.
 (26) 27. Hind tarsi not at all white-marked.
 (35) 28. Mesopleurae closely punctate and dull.
 (32) 29. Flagellum testaceous ; wings entirely hyaline.
 (31) 30. Head posteriorly very narrow ; abdomen all testaceous. 14. *testaceus*, Grav.
 (30) 31. Head distinctly a little explanate posteriorly ; abdomen often basally infuscate. 15. *subfuscus*, Cress.
 (29) 32. Flagellum piceous or black ; wings distinctly infumate throughout.

- (34) 33. Stigma testaceous ; length 15 mm. 16. *tinctipennis*, Cam.
 (33) 34. Stigma piceous ; length 18-25 mm. 17. *diversus*, Szépl.
 (28) 35. Mesopleurae glabrous and shining.
 (39) 36. Stigma black.
 (38) 37. Mesonotum testaceous ; alar apices strongly infumate.
 18. *fuscipennis*, Szépl.
 (37) 38. Mesonotum black ; wings hyaline. 19. *melanostigma*, Cam.
 (36) 39. Stigma and thorax not black, nor alar apices clouded.
 (43) 40. Abdomen unicolorous ; mesopleurae almost entirely glabrous.
 (42) 41. Head strongly constricted posteriorly ; stigma dark-margined.
 20. *liopleuris*, Szépl.
 (41) 42. Head posteriorly broader ; stigma unicolorous.
 21. *texanus*, Ashm.
 (40) 43. Anus black ; mesopleurae distinctly punctate.
 22. *lucidulus*, Szépl.
 (1) 44. Scutellum and abdomen, antennae and head, black.
 23. *lugubris*, Spin.

1. *Paniscus semirufus*, Holmgr.

Eugenies Resa, Insect. 1868, p. 412.

The description is very short and apparently inadequate, excepting that no other South American species is pale stramineous with only the abdomen, thoracic vittae and hind femora rufescent. Length, 14 mm. Holmgren compares it with the Pacific *P. latro* and remarks that here the distance between the base of the internal cubital nervure and apex of the internal recurrent is much shorter. He found it at Rio Janeiro, and indicates no sex.

2. *Paniscus brasiliensis*, Szépl.

Ann. Mus. Hungr. 1906, p. 155, ♂.

Szépligeti gives a good description of this testaceous male with black flagellum and nervures, hyaline wings with their flavidous-brown stigma. It is 22 mm. in length, and was found at Villa Bella in Brazil.

3. *Paniscus geminatus*, Say.

This name is an enigma to me, since the American systematists seem to have forgotten to redescribe it (*cf.* Proc. U.S. Nat. Mus. 1890, p. 425) and I expect it to prove synonymous with some common palaearctic insect. It was brought forward from Indiana as dull yellowish with the head and

scape yellow, flagellum tinged with brown, wings hyaline with "honey-yellow somewhat dilated carpal spot" (stigma), pleurae and sternum pale yellowish: the structural details are useless. All this agrees perfectly with specimens named by Prof. Riley, and sent from Denver by him to the Rev. T. A. Marshall, but the length is stated to be only about two-fifths of an inch and the vertex bears a black spot, which is not the case in Riley's insects, for these are entirely very pale testaceous and substramineous with the head as broad posteriorly as in *P. cephalotes* (of which it appears to me to be but a pale form) with the vertex and glymmæ immaculate, and the metathoracic cristulae transversely linear; the stigma, as described in Leconte's Writings of Thomas Say, Entom. 1, 1859, 379, is paler than in other American species. Riley's specimens are nearly 18 mm. in length and doubtless represent the larger form referred to by Norton (Proc. Ent. Soc. Philad. 1, 1863, p. 364), of which the smaller, "length 0.48, br. wings 0.72 in.", very possibly represented *P. opaculus*, though I have seen no specimens from so far north as New England, New York, New Jersey, Pa., Del., Md., Va., Ill., Cal., from which American States and Canada he records it. Further south, it is no more rare, for Cresson terms it "very common" in Mexico, though more than one species may be included since he remarks upon the varying size of 10-18 mm. (Proc. Acad. Nat. Sc. Philad. 1873, p. 382). In 1883, M. l'Abbé L. Provancher (Petite Faune Ent. du Canada II, 360) synonymises his *P. appendiculatus* (Natural. Canad. VI, 1874, p. 105) with this species, a wing of which is badly represented at fig. 39, and differentiates it by its elongate ramellus—a feature utterly lacking in Riley's examples, though considered good by Ashmead (Proc. U. S. Nat. Mus. 1890, p. 425). Cameron misrepresents the species in Biol. Centr. Amer. 1886, and no one has since mentioned it. The figure in Biologia, pl. xiii, fig 5, represents a large ferrugineous Paniscus with concolorous stigma indifferently well, though the antennae are too slender and the discocubital nervure too straight; the original of it is in the British Museum and certainly belongs to the only species I know with distinct ramellus, to which Say makes no reference while considering the colour pale. Brullé's "nervure moyenne offre une petite saillie dans son milieu" in *P. rufus* and it is probably the frequent synonymy between this and *P. geminatus* which has caused a ramellus to be assigned to the latter. I have seen no example of *P. geminatus*, as understood by Riley, south of Mexico; the British Museum has specimens from Ithaca taken on 5th September, 1892,

and 19th July, 1895; Canandaigua in New York on 27th July, 1897; Denver in 1888 (Riley in coll. Marshall); Marinlo in California (H. Edwards, 1884); and several from La Venta, Amula and Xucumanatlan in Guerrero, Mexico, varying from 300 feet in September to 7,000 feet in July (H. H. Smith). I entirely concur with Norton (Proc. Ent. Soc. Philad. 1863, p. 364) that *Ophion chloris*, Olivier, "d'une couleur testacée pâle" (Encycl. Meth. VIII, 1811, 509), found in north America, is with but little doubt synonymous with the present species but the last fifty years has not advanced this probability.

4. *Paniscus gerlingi*, Schrottky.

Anales del Museo Nacional de Buenos Aires VIII, 1902, p. 91, ♂.

Yellow-ochre; head pale yellow with the mandibles apically black; antennae somewhat darker than the body with the third joint shorter than the fourth and fifth together, but much longer than the former alone; notauli distinctly impressed; metathorax feebly transrugose, with a distinct carina beyond its centre; basal segment a little longer than the second; legs and tarsi concolorous with the body: alar nervures dark piceous; stigma yellow-ochre; length, 13 mm. and expanse 12 mm. The antennal conformation is said to be as in *P. geminatus*, Say (which Schrottky synonymises with *P. rufus*, Brullé); but the submedian cell is shorter. The type, taken at the General Paz Lake in the Chubut district of Patagonia—or, more correctly, Chile—during March, 1902, is in the author's collection. There is little that is distinctive in this description, yet I have no hesitation in ascribing to it eight Chilean specimens in the British Museum on account of their peculiarly pale testaceous coloration, flavidous head and yellow-ochre stigma; they agree in the other points instanced, have the ocelli contiguous with the eyes but broadly discreted *inter se* with no black region, the legs are equally pale and the temples somewhat broad; but the peculiar feature given by Schrottky is the complete meta-thoracic carina, extending not only from side to side but also apically to the hind coxae, beyond which the petiolar area is nitidulous; and one, that he has overlooked, though peculiar to this species in my experience, is the strong curve taken by the median nervure beyond the nervulus. These are all from Chile: three females taken by T. Edmonds, four males near Santiago by Bartlett Calvert, and another found by Dr. Coppinger, during the Voyage of H.M.S. "Alert" in September, 1879, at Talcatuano on the coast.

5. *Paniscus nodulosus*, sp. n.

Related in its general structure and immaculate vertex to *P. rufus*, but with the abdomen of both sexes somewhat conspicuously dilated beyond its centre, the coloration much more flavidous and especially that of the head and thorax, which renders relationship with Holmgren's mainland species not improbable. The antennae of both sexes are no longer than three-quarters of the body, a little stouter than is usual in this genus with apices of the joints strongly and conspicuously nodulose. The ocelli are contiguous with the eyes, but widely discreted *inter se*, with no black region. The nervulus is not strongly postfurcal, the stigma is flavidous and the subpetiolate areolet somewhat broad; length, 15-18 mm. Three specimens, comprising both sexes, were taken by Col. A. M. Reid on East Island in the Falklands between November, 1908, and the following February; and he also took another male, about the same time, at Hill Cove in the West Falklands.

6. *Paniscus testaceus*, Grav., var. *opaculus*, Thoms.

Opusc. Ent. xii, 1888, 1199. ♀.

Szépligeti introduces Thomson's species as neotropic (Ann. Mus. Hungr. 1906, p. 155) on the strength of a ♂ found at Mapiri in Bolivia, which differed but slightly from European examples. Some forty specimens, taken by H. H. Smith in Central America do not differ in any way, unless the head be extremely slightly broader posteriorly; these are from various localities at altitudes of 2,800-8,000 feet in Guerrero in June, July, August and October, from Atoyac in Vera Cruz in April, and from Teapa in Tabasco during March.

7. *Paniscus rufus*, Brullé.

Hist. Nat. Hym. iv, 1846, 155.

Ashmead seems inconsistent in assigning to *P. geminatus* a ramellus, and naming as *P. rufus* specimens with none; but I do not know that he considered the two synonymous. I consider *P. rufus* to be a somewhat large and slender species with the head neither strongly constricted nor explanate posteriorly, the ramellus minute though present and the whole colour including that of the stigma deep testaceous-red; the antennae are red: those examples with them only basally red and "noires dans le reste de leur étendue" are probably referable to *P. tinctipennis*. Its author says this species has been taken in Mexico by Mme. Sallé (a ♀ specimen,

taken by her at Orizaba, is in the British Museum), Brazil, Guinea, Chile, North America and Cuba; though Cresson (Proc. Ent. Soc. Philad. 1865, p. 57) did not know it. I suspect more than one species is here included, especially since my restricted form of Brullé's species appears almost confined to Mexico, where it abounds, and I have seen over sixty examples taken at Omilteme in 1887, Patzcuaro, Sierra de las Aguas Escondidas, Xucumanatlan, Amula, Teapa, Mexico City, Jalapa, etc., Marshall (Ann. Soc. France, 1892, p. 65) considered it somewhat variable, "mais non susceptible de division." The only United States examples I have seen are three females presented in 1839 and 1843 by Edward Doubleday, who found them at Trenton Falls, New York.

8. *Paniscus ignotus*, sp. n.

This species has been figured by Cameron (Biol. Centr. Amer. Hym., 1, 1886, pl. xiii, fig. 5, ♂), and, along with specimens referable to *P. rufus*, Brullé, has been wrongly identified by him (*l.c.* p. 302) as *Paniscus geminatus*, Say. It is instantly known from *P. rufus* in its darker coloration, the ferrugineous stigma and more strongly curved nervulus, but especially in the strong and linear ramellus; length 20-21 mm. Cameron had seen a single male from the Volcan de Chiriqui, found by Champion at an altitude of 2-3,000 feet and now in the British Museum; this is the type of my species. With it are two females from Peru (Rosenberg, 1906), and Colonia Tovar in March, 1888 (coll. T. A. Marshall).

9. *Paniscus medius*, Ashm.

Proc. Calif. Acad. Sc. 1894, p. 128, ♀.

I should have been tempted to regard this unique female from San Esleban in Lower California as a small form of *P. ignotus* (though its colour, "brownish-yellow," is a little ambiguous to an English mind) on account of its distinct ramellus, were it not that the "thorax is smooth, trilobed; metanotum smooth, without a vestige of carinae," whereas in my species it is, though also trilobed, closely sculptured throughout.

10. *Paniscus alaskensis*, Ashm.

Proc. Washington Acad. Sc. 1902, p. 237, ♂.

This is the only species of the genus found by the Harriman Alaska Expedition, the Hymenoptera of which were described by Ashmead, *l.c.* pp. 117-274. We must suppose it to

possess a ramellus since "the venation is as in *P. geminatus*," to which Ashmead consistently accords this adjunct. It appears distinct in its discreted lateral ocelli, "stigma yellow," abdomen and thorax "honey-yellow"; on the latter "the apical transverse carina is indicated only laterally, being wholly obliterated medially, the surface of the metanotum before it being very finely, transversely aciculate, behind it polished and impunctate." Five males were procured early in July at Kukak Bay.

11. *Paniscus immaculatus*, sp. n.

Extremely like the species I here term *P. rufus*, and immaculate deep red throughout with the orbits hardly paler and only the eyes black; therefrom it differs in its more prominent eyes, smaller and narrower stigma, less explanate apex of the costa, straighter base and apex of the radial nervure, more perfectly hyaline and less ample wings, nervellus intercepted at upper fourth in place of the upper third, scutellum less convex and basally narrower, face less convex and exactly parallel-sided in place of slightly constricted towards its apex; but especially in the coriaceous metanotum, which bears smaller apophyses and is not or hardly at all transaciculate. The stigma is clear testaceous. Length 17-19 mm. There are four ♀♀ of this species in the British Museum, from the United States, all taken before 1850.

12. *Paniscus albovariegatus*, Prov.

13. *Paniscus albotarsus*, Prov.

Natural. Canad. 1874, p. 106.

These two Canadian species differ from all the remainder of the genus in their pure white coloration: in the latter of the hind tarsi and face, and in the former in both capital and thoracic markings. They appear somewhat untypical and Ashmead thought the male of the former to be a new Tryphonid, *Perilissus paniscoides* (Trans. American Ent. Soc. 1896, p. 197). Both are unknown to me.

15. *Paniscus subfuscus*, Cresson.

Proc. Ent. Soc. Philad. 1865, p. 57, ♀.

There is no single distinctive character in Cresson's diagnosis—a good example of the inutility of detailed and

uncritical descriptions in these closely allied species—and I must own that the specimens I place here owe their position to their main locality, the West Indian Islands. One can say no more than that they agree with the above-quoted description! Both sexes are extremely closely allied to *P. rufus* and were doubtless mixed with it by Brullé, but they may be known by their constantly black ocellar region and rather longer antennae, but especially by the distinctly broader temples. The British Museum contains examples from Trinidad (Beaven Rake), Bay Mount in Barbados on 2nd October, 1902 (Lefroy), Balthazar on Windward side of Grenada (H. H. Smith) and five, labelled "*Paniscus rufus*, Br." by Ashmead, presented by the West Indies Exploration Committee in 1899. From these I quite fail to distinguish half a dozen of the examples captured by Godman and Smith in Mexico at Orizaba, Teapa in Tabasco, Jalapa and Omilteme in July and December, 1887. An exactly similar ancient male, also in the British Museum, is, doubtless incorrectly, labelled "Nova Scotia; Redman."

16. *Paniscus tinctipennis*, Cam.

Biol. Centr. Amer. 1886, p. 303, ♀.

Cameron gives a rambling description of little but colour, from which one gathers that the type, captured by Champion at 2-3,000 feet on Chiriqui in Panama and now lost, was very closely allied to the next species in its infumate wings, etc., but with the stigma testaceous; and that it had a total length of at most 20 mm. The British Museum possesses a dozen examples from Guerrero, and it is easily known by the black flagellum, stout outline, distinctly broad vertex and clear testaceous stigma.

17. *Paniscus diversus*, Szépl.

Ann. Mus. Hungr. 1906, p. 155, ♂ ♀.

A large testaceous species of 25 mm., with the ocellar region black, the flagellum piceous, and the wings infumate, apically darker with brown stigma. Similar to *P. braziliensis* but with no alar ramellus, the nervulus less postfurcal, etc. The type occurred at Merida in Venezuela; and the only female I have seen is remarkable for the entirely transbicarinate metathorax and elongate ramellus; it was captured by Smith at Xucumanatlan in Guerrero at an altitude of 7,000 feet during July.

18. *Paniscus fuscipennis*, Szépl.

Ann. Mus. Hungr. 1906, p. 156, ♂; *P. szepligetii*, Schulz, Berl. Ent. Zeits. 1907, p. 323.

A conspicuous species of 17 mm., with the stigma, nervures, flagellum and ocellar region black, the wings infumate and apically darker. It was found at Malpiri in Bolivia, and has been termed *P. szepligetii* by Schulz; but there is no need to adopt the latter name, since we know *Paniscus fuscipennis*, Grav. to belong to the genus *Opheltes*, Holmgr. Both sexes, in the British Museum, were found by H. H. Smith at Amula in Guerrero at an altitude of 6,000 feet during August and September. I doubt its distinction from the last species.

19. *Paniscus melanostigma*, Cam.

Biol. Centr. Amer. 1886, 303, ♀.

The only species from this region with the mesonotum black; the stigma is concolorous and the wings hyaline, which distinguishes it from the last species. Taken with *P. tinctipennis* on Chiriqui and, like it, the type is now lost. *P. nigripectus*, Ashm. (Proc. U.S. Nat. Mus. 1889, p. 425) is obviously synonymous and the single Texan female known differs only in also having the mesosternum black—thus reminding one forcibly of the antipodean *P. ephippiatus*.

20. *Paniscus liopleuris*, Szépl.22. *Paniscus lucidulus*, Szépl.

Ann. Mus. Hungr. 1906, p. 156.

From their author's short diagnoses of these sexes, from Malpiri and Bolivia, they scarcely appear distinct species to me; but the ♂ is 15 mm. and the ♀ only 10 mm. in length. The females of *P. liopleuris*, in the British Museum, were captured by H. H. Smith at Omilteme at 8,000 feet and Acaguizotla at 3,500 feet in Guerrero, and at Teapa in Tabasco.

21. *Paniscus texanus*, Ashm.

Proc. U.S. Nat. Mus. 1889, p. 425, ♀.

Very distinct in its glabrous mesonotum and small size, in its subcubical head and short second segment, which is only half as long as the discally sulcate first. I do not understand Ashmead, "the submedian cell is as long or slightly

longer than the median cell, the length of the transverse median nervure"; if used in the sense of Marshall's cellules "costale et mediane" (Braconides d'Europe, I, pl. i), this structure would render the species a *Parabatus*. This, however, does not seem to be intended, since a female *Paniscus* in the British Museum, from the coast of Maine, taken by R. E. Danfurth, agrees in every other particular with its description.

Among examples of *P. liopleuris* taken by H. H. Smith in Guerrero, three from Tepetlapa at 3,000 feet in October, and from Amula at 6,000 feet in September, differ materially in having the vertex by no means narrow, the head posteriorly nearly as broad as the eyes, the areolet a little broader and not at all petiolate, the size averaging smaller and the conformation less robust, with the stigma unicolorous pale grey and not "schwarz gerandet." These three examples differ from *P. texanus* in no way.

23. *Paniscus lugubris*, Spin.

Gay, Hist. fis. Chile, Zool. VI, 1851, p. 513, ♀.

This female certainly belongs to some *Campoplegid* genus, but is treated of here for lack of a better position; Spinola himself thought Gravenhorst would probably have placed it in *Macrus*. It is described in Spanish: Head black, with the mandibles and palpi whitish. Antennae slender and filiform, black and not apically curled, hardly reaching apex of basal segment. Thorax finely punctate and pubescent; metathorax elongate, slightly convex with its disc on one plane and its apex gently declived, bisected a little above its centre by a weak transcarina, before which it is smoother and centrally broadly impressed. Scutellum and abdomen black, with second segment flavidous beneath; basal segment linear, apically slightly explanate; second and the following segments strongly compressed, with the accidentally vertical terebra about one mm. in length. Legs slender with the tarsi of normal breadth, and rufescent with the hind coxae and trochanters, tarsi and their tibial apices black. Wings hyaline with stigma and nervures black, tegulae whitish; areolet small, rhomboidal and elongately petiolate. Length, 9 mm. ♀ only. Chile.

TABLE OF AFRICAN SPECIES.

- (8) 1. Stigma black, or, at least, distinctly nigrescent.
- (5) 2. Abdomen nearly entirely black throughout.
- (4) 3. Whole abdomen nitidulous and entirely deep black.

I. *errans*, Tosq.

- (3) 4. Abdomen black with its sides and first segment pale.
2. *planipes*, Tosq.
- (2) 5. Abdomen at most black only at base or apex.
- (7) 6. Thorax slender and black; abdomen apically testaceous.
3. *insulicola*, sp. n.
- (6) 7. Thorax stout and testaceous; abdomen apically black.
4. *madeirensis*, sp. n.
- (1) 8. Stigma pale, and never darker than brick-red.
- (10) 9. Abdomen apically and laterally infusate; external submarginal nervure produced.
5. *melanocotis*, Holmgr.
- (9) 10. Abdomen unicolorous testaceous; submarginal not produced.
- (12) 11. Thorax broadly white-marked.
6. *elegans*, Szépl.
- (11) 12. Thorax subunicolorous testaceous.
- (16) 13. Occiput not discreted from vertex by a carina.
- (15) 14. Ocellar region pale; lower basal nervure elongately postfurcal.
7. *ocellaris*, Szépl.
- (14) 15. Ocellar region black; lower basal shortly postfurcal.
8. *parvulus*, Szépl.
- (13) 16. Occiput discreted from vertex by a carina.
- (26) 17. Nervulus (lower basal nervure) suboblique and curved above.
- (19) 18. Temples hardly narrower than eyes; abdomen stout.
9. *cephalotes*, Holmgr.
- (18) 19. Temples distinctly narrower than eyes; abdomen slender.
- (23) 20. Stigma clear red; wings slightly flavescent; larger.
- (22) 21. Head narrower than thorax; temples strongly rounded posteriorly.
10. *rufescens*, Tosq.
- (21) 22. Head as broad as thorax; temples parallel-sided.
11. *perforatus*, Schulz.
- (20) 23. Stigma pale testaceous; wings quite hyaline; smaller.
- (25) 24. Metathoracic cristulae distinct; basal segment simple.
12. *testaceus*, Grav.
- (24) 25. Metathoracic cristulae wanting; basal segment transimpressed before its centre.
13. *perforator*, Smith.
- (17) 26. Nervulus vertical and straight throughout.
14. *aethiopicus*, Szépl.

I. *Paniscus errans*, Tosq.

Mém. Soc. Ent. Belg. 1896, p. 402, ♀.

Tosquinet seems to have known but a single large female of 22 mm. of this distinct species, from "Hadda Galla, Dainbi (Antinori, 4 mai, 1829, Musée civique de Gênes)," probably Gallaland in southern Abyssinia. It is easily recognised by the entirely deep black abdomen, of which the basal segment is never, like the head and thorax, testaceous; the flagellum is entirely black or only apically piceous, with the hind femora and tibiae occasionally nigrescent; the temples are by no

means inconspicuous, though narrower than the eyes; the areolet is small and narrow, the stigma always dark ferruginous or nigrescent, nervellus intercepted distinctly a little above its centre; scutellum laterally margined to its extreme apex; thorax dull and clear red with notauli deeply impressed to its disc; abdomen peculiarly nitidulous with recumbent pubescence, its terebra nearly as long as the basal segment with valvulae black and apically attenuate. There is a second female of 20 mm., with hind legs mainly black, in the British Museum, presented in 1895 by G. F. Scott Elliot, who captured it at an altitude of 7-8,000 feet on Mount Ruwenzori, Uganda; Neave also found a single female in British East Africa, on the basal eastern slope of the Aberdare Mountains between 7,000 and 8,500 feet, towards the end of February, 1911.

2. *Paniscus planipes*, Tosq.

Mém. Soc. Ent. Belg. 1896, p. 404, ♀; *P. seminiger*, Szépl., Sjöstedt's Kilimandjaro-Meru Expedition 1910, p. 90, ♂.

Fulvous, stout, dull and finely punctate; head nitidulous, as long as broad, not or hardly constricted posteriorly, with the ocellar region black; face subquadrate, centrally broadly and somewhat strongly convex; ocelli distinctly discreted from the eyes; antennae very long, slender, infusate with the scape and underside of the basal joints red; thorax dull, with notauli somewhat deeply impressed and their interlobes subinfusate; metathorax distinctly trans-striate, with the cristulae small; scutellum elongate, convex, pale luteous, laterally margined and apically truncate; abdomen, except laterally and the basal segment, infusate; terebra one-sixth the length of the body, dull red with valvulae pale-infusate and apically nigrescent; wings very large and slightly flavescent; stigma dark red, with a hyaline basal spot; areolet narrow, rhomboidal and subsessile; nervellus intercepted in or slightly above its centre. The ♀, of 25 mm., was described from Italian Somaliland in July. Several of the same sex, of but 17-20 mm., in the British Museum, were taken in British East Africa and presented in 1900 by C. S. Betton; at least one of these occurred at the Athi River during the preceding May; and all have the nervellus intercepted a little above its centre. Szépligeti's *P. seminiger* differs only in the nervulus being further postfurcal and certainly constitutes the other sex of *P. planipes*, from which I find nothing whatever in Cameron's description of his *P. melanogaster* from near Cape Town (Ann. S. African Museum 1906, p. 101, ♂) to distinguish it, except possibly the black scutellar carinae.

3. *Paniscus insulicola*, sp. n.

There is a series of two males and three females, captured by Wollaston in St. Helena, in the British Museum. These are unique in the present genus—excepting an Australian species—in their entirely black thorax. The antennae, coxae, vertex, occiput and femora are also black; the basal segment, or segments, and stigma are nigrescent, with remainder of the insect ferruginous; the mouth and venter alone are fulvidous; the head is posteriorly very narrow, the notauli deeply impressed, the scutellum laterally margined throughout and the metathorax is dull and very closely trans-aciculate, with minute but distinct cristulae; the terebra is nearly as long as the basal segment and the female antennae a little shorter than the body; length, 16-18 mm. Doubtless a local race of *P. testaceus*, Grav., but much darker and duller with the sculpture closer throughout. For an account of the affinity of the St. Helena fauna with that of Europe, cf. Buchanan White (Proc. Zool. Soc. 1878, p. 444), "Contributions to a Knowledge of the Hemipterous Fauna of St. Helena, and Speculations on its Origin."

4. *Paniscus madeirensis*, sp. n.

Allied in coloration to *P. testaceus*, Holmgr. (*nec* Grav.; =*melanurus*, Thoms.) in its metathoracic structure, margined scutellum, testaceous body and determinately black anus from base of the fifth segment; but with the antennae shorter and subinfusate, costa and stigma deep black and head slightly broader behind the eyes. The lower basal nervure is but a little postfurcal, the areolet is always broader and emits at least a short nervure from its external centre and the ramellus is often strong. Two pairs, in the British Museum, were captured in Maderia by Wollaston.

5. *Paniscus melanocotis*, Holmgr.

Eugenies Resa. Insect. 1868, p. 411, ♀.

I have seen no African female Panisci combining infusate anus (as described by Holmgren from Mauritius) with the stigma dull fulvous and its lower margin pale (as given by Tosquinet, Mém. Soc. Ent. Belg. 1896, p. 407, from Cape Colony). Cameron appears to have mingled more than one species under this name, which he erroneously ascribes (Ann. S. Afr. Mus. 1906, p. 101) to Brullé, whose *P. melanopus* is very probably synonymous, though the stigma is said to be

darker, not paler, at its external margin. Smith tells us (Ann. Nat. Hist. 1876, xvii, p. 449) that both stigma and nervures are black, which can hardly be the case. The ♂ is still unknown.

6. *Paniscus elegans*, Szépl.

Annales Musei Nationalis Hungarici 1905, p. 540, ♀.

This Tunisian species seems to differ from *P. brachycerus*, Thoms., mainly in its white-marked thorax.

7. *Paniscus ocellaris*, Szépl.

Sjöstedt's Kilimand. Exped. II, 1910, 89, ♀ (nec Thoms.)

Very like *P. testaceus*, var. *opaculus*, Thoms., but with the head distinctly broader posteriorly and the stigma paler, subflavious. Guy Marshall took the ♂ at Victoria Falls in Rhodesia during September, 1905; and it has a wide distribution, for Dr. Krauss found it in Natal about 1840, the Hon. W. Rothschild in Algiers Town in May, 1908, and both Wollaston and Mrs. Hope took it in Madeira. I have seen nothing like *P. parvulus*, Szépl. (l.c.), which differs from his *P. ocellaris* in its black ocellar region, with the nervulus less postfurcal and only a third in place of a half its own length from the upper basal nervure.

9. *Paniscus cephalotes*, Holmgr.

Sv. Ak. Handl. 1858, P. VIII, p. 31, ♂ ♀.

The African representatives of this common north European species are all from the Azores, and it probably does not extend to the Continent. They are untypical in their stout basal segment, deeply impressed segmental incisures and not very broad temples. Major Chaves of the Ponta Delgada Museum, presented both sexes, probably found on San Miguel, and there is a very stout pair taken "above Magdalina on the Pico volcano at an altitude of one thousand feet on 17th May, 1903," and "above Cais do Pico at the same height on 21st of May," by W. R. O. Grant.

10. *Paniscus rufescens*, Tosq.

Mém. Soc. Ent. Belg. 1896, p. 409, ♂ ♀.

Fulvous and very finely punctate; head flavous and posteriorly narrow with the ocellar region infusate; face quadrate, centrally fulvous and strongly convex; ocelli distinctly discreted from eyes; antennae very slender and as

long as the body, fulvous and apically subinfusate; notauli not deeply impressed; metathorax finely trans-striate, with the lateral cristulae small; scutellum elongate, narrow, convex and laterally margined; abdomen immaculate fulvous; terebra one-sixth of the length of the body, badius with black valvulae; wings very large, very slightly flavescent with the stigma clear red; areolet small, irregular and hardly petiolate; nervellus intercepted above its centre. Length 13 mm. in both sexes, which are recorded only from Morocco by Tosquinet and the North of German East Africa by Szépligeti, who differentiates it (Kilimand. Exped. 89) from his *P. ocellaris* and *P. parvulus* by its margined occiput. The five females in the British Museum are 17-19 mm. in length and were taken in different localities by C. S. Betton at Lari in August, 1899, by Dr. W. M. Graham at Obuasi in Ashanti in 1908, by Dr. Sladden at Cyrene in Tripoli on 30th October, 1910, and by Gueinzus of Leipsic at Port Natal (Durban) in 1849. *Paniscus capensis*, Holmgr. (Eugenies Insect. 1868, p. 412, ♂ ♀) is very possibly synonymous, but the description is too short to allow of certainty in this respect; I tentatively place, as representing it, a couple of ♀♀ from the Transvaal and Nairobi in May, 1899, which differ from *P. rufescens* only in their infusate-ferrugineous stigma and in their darker rufescent body.

11. *Paniscus perforatus*, Schulz.

Bucheckerius perforatus, Schulz, Spolia Hym. 1906, p. 285, ♂.

The unique example constituting the type of this species and of the genus *Bucheckerius* is a male, captured by L. Conradt at Sa. Isabel in Fernando Po, on 1st May, 1900, and acquired by the British Museum in 1908; there is in the Museum also, another ♂, taken on the Congo in 1843 by Andrew Curror, M.D., R.N. It is difficult to conceive of a writer upon Ichneumonidae being ignorant of the genus *Paniscus*, yet so far from *Bucheckerius* presenting different generic characters it is with some hesitation that I distinguish the type (to which more than seven pages of "Spolia" are devoted) from *P. rufescens*, by its duller sculpture and longer head with the temples distinctly a little broader throughout.

12. *Paniscus testaceus*, Grav., var. *opaculus*, Thoms.

This species is common, at least in the east and south of the Continent; Lucas records it from Algeria in 1846. Tosquinet's description of his *P. pallidus* (Mém. Soc. Ent. Belg.

1896, p. 406) differs but very slightly from that of his *P. rufescens* in the paler coloration which is inconstant, in the ocelli subcontiguous with the eyes, the somewhat smaller wings and pale fulvous stigma; length of ♂ 17 mm. He appears to have relied upon the distance of Cape Colony and Togoland, whence alone he knew this species, from Morocco to assist in discrimination. In spite of the length indicated, I consider *P. rufescens* to average larger. There is nothing in the account of *P. pallidus* (*l.c.*) that does not equally well apply to the common pale form of *P. testaceus* and I consider them entirely synonymous. Examples in the British Museum are from Abbai Affat in Abyssinia, May, 1902 (Degen); Athi-ya-Mawe, Rogoro and Naitolia in British East Africa, April, 1899 (C. S. Betton); Mengo in Uganda (E. Miller); Salisbury in Mashonaland, 1st April, 1899 (Guy Marshall); Bloksberg, near Johannesburg (C. H. Peard); Piet Retief in Transvaal and on 13th January, 1902, at Maserr in Basutoland (R. Crawshay); Lindley in Orange R. Colony; South Africa in 1844 (Dr. Smith); Durban (J.P. Cregoe and H. A. Spencer), and Howick (Cregoe), in Natal; and Queenstown in Cape Colony (E. T. Wells).

13. *Paniscus perforator*, Smith.

Ann. Nat. Hist. xvii, 1876, p. 449, ♂ (*sic* ♀).

This is a true *Paniscus*, and not *Ophion* as placed by Dalla Torre. It is extremely closely related to the common *P. testaceus* and probably no more than a local race, with the lateral metanotal cristulae wanting, the stigma a little darker, the notauli closer together, with the epistoma nitidulous and but obsoletely pubescent; length, 13 mm. I have only seen the type (a ♂, not ♀ as Smith stated), which was captured by Slater on Rodriguez in the Mascarene Islands.

14. *Paniscus aethiopicus*, Szépl.

Bull. Mus. Paris 1907, p. 139, ♀.

The description of this south Ethiopian species is very short, but the nervulus appears to agree with that of two males and a female, presented by D. MacAlister in 1900 to the British Museum from northern Etbai in Upper Egypt, which differ from all other species with which I am acquainted in having the nervulus vertical and quite straight, not at all curved before its junction with the median nervure.

TABLE OF ASIATIC SPECIES.

- (26) 1. Labrum not spinately produced centrally.
 (3) 2. Subglabrous; metanotum not at all striate; length 8 mm.
 1. *laevis*, Cam.
 (2) 3. Punctate; metanotum distinctly striate; length at least 10 mm.
 (19) 4. Notauli distinct at least to centre of mesonotum.
 (6) 5. Head, thorax and coxae black. 2. *grumi*, Kok.
 (5) 6. Head, thorax and coxae testaceous.
 (8) 7. Scutellar carinae apically acuminate and coalesced.
 3. *intermedius*, Cam.
 (7) 8. Scutellar carinae neither acuminate nor coalesced.
 (16) 9. Metanotum very finely transaciculate; stigma not deep red.
 (13) 10. Head posteriorly about breadth of eyes; vertex distinctly broad.
 (12) 11. Metathoracic transcarina obsolete; antennae nigrescent.
 4. *unicolor*, Smith.
 (11) 12. Metathoracic transcarina strong; antennae testaceous.
 5. *cephalotes*, Holmgr.
 (10) 13. Head posteriorly narrower than eyes; vertex not broad.
 (15) 14. Stigma infusate; hind tarsi stramineous.
 6. *nigriventris*, Brullé.
 (14) 15. Stigma flavescent; hind tarsi not paler than tibiae.
 7. *lineatus*, Brullé.
 (9) 16. Metanotum strongly strigose; stigma clear, deep red.
 (18) 17. Mesonotum unicolorous. 8. *testaceus*, Grav.
 (17) 18. Mesonotum with four distinctly pale vittae.
 9-4. *lineatus*, Smith.
 (4) 19. Notauli distinct at most on apical two-thirds of mesonotum.
 (25) 20. Thorax immaculate testaceous; metanotum more or less sculptured.
 (22) 21. Ocellar region black; metathorax strongly striate.
 10. *orientalis*, Cam.
 (21) 22. Ocellar region pale; metathorax but feebly striate.
 (24) 23. Head posteriorly constricted; antennae pale; nervulus sub-vertical.
 11. *gracilipes*, Thoms.
 (23) 24. Head vertically broad; antennae infusate; nervulus oblique.
 12. *capito*, Kok.
 (20) 25. Thorax broadly flavous; metanotum glabrous.
 13. *flavolineatus*, Cam.
 (1) 26. Labrum centrally produced into an elongate spine.
 14. *montanus*, Cam.

1. *Paniscus laevis*, Cam.

Spolia Zeylanica 1905, p. 127, ♀.

Distinct among the Asiatic species in its glabrous body, subimpunctate head and thorax, smooth metanotum and

small size, not exceeding 9 mm. in both sexes. ♂ ♀. It is not uncommon in India, and is especially common in Ceylon, whence it extends to Bengal.

2. *Paniscus grumi*, Kok.

Revue Russe d'Entom. 1906, p. 165, ♂ ♀.

The only Asiatic species with black head and thorax, but in these particulars closely related to my *P. dimidiatus* and *P. insulicola*, from the former of which it differs in its dark ferrugineous stigma, strongly transaciculate metanotum, posteriorly broader head, conspicuous notauli and less post-furcal nervulus; the resemblance to the latter is remarkable, but the short ramellus is distinct and the metanotal sculpture quite different. It has been found at such widely separated localities as Sand-ho in China and Askabad in Transcaspia, which is about six hundred miles from Chaman on the Kojuk Pass in Afghanistan, where two females in the British Museum were captured by Col. Chas. Swinhoe on 28th July, 1880, at 11 p.m. during mess, probably attracted to light.

3. *Paniscus intermedius*, Cam.

Spolia Zeylan. 1905, p. 125.

Known by its small size of 10-11 mm., the nervellus intercepted at bottom of its upper fourth (not third), and by the scutellar carinae being apically coalesced into an acute angle, whereas in other species they neither extend beyond apex nor unite. I have seen the type (from Maskeliya in the British Museum), examples from Madulsima (also in Ceylon) and southern Kashmir; and Bingham took others at Kasauli in the Punjab in 1896 and 1902.

4. *Paniscus unicolor*, Smith.

Trans. Ent. Soc. 1874, p. 396, ♂.

This very superficially described male, from Hiogo in Japan, is in the British Museum and very closely allied to *P. fuscicornis*, Holmgr. (= *P. dilatatus*, Thoms.), but the head is altogether paler, the antennae ferrugineous and not black, and the wings are decidedly more ample; probably no more than a local race. The ♀, of which an example was found in Japan by Mr. Jones in 1877, differs only sexually from the type. It seems confined to eastern Asia; and a form intermediate between the var. *unicolor*, Smith, and typical *P. fuscicornis*, Holmgr., with the antennae stout, infusate

(not nigrescent) and slightly shorter than the body, occurs at Singapore, Johore and Penang, in the Malay States, and the Dinding Isles (H. N. Ridley); Sandakan in north Borneo; Peel Island in the Bonin Isles of the north Pacific; Hong Kong, and at Tai Yuan in northern China, where Douglas found a male in August, 1908.

5. *Paniscus cephalotes*, Holmgr.

Sv. Ak. Handl. 1858, P. VIII, p. 31.

Though *Dicranura vinula*, the host of this parasite (which is certainly the *Ophion vinulae* of Stephens' Catalogue, 1829, p. 351), is not recorded by Staudinger to the east of the Pamirs, *Dicranura himalayana*, Moore, is found at Dharmasala in the north-west Himalayas, and that it also is attacked by the present species is rendered almost certain by the capture there of a typical pair of *P. cephalotes* in the north-west Provinces (Mrs. Horne, 1884), "India" (Baly, 1851) and also a ♀ in the Khasi Hills of Assam (Col. Badgley, 1906). In addition to the above specimens, the British Museum has a long series of *P. cephalotes* collected by Escalera in the south-west of Persia.

6. *Paniscus nigriventris*, Brullé.

Hist. Nat. Ins. Hym. iv, 1846, p. 157, ♀; *Paniscus Ceylonicus*, Cam., Manch. Mem. 1897, p. 31, ♀.

Similar to *P. testaceus*, and varying from 14—nearly 25 mm. in length, but decidedly more nitidulous, smoother and always paler, with the notauli much more deeply impressed and the stigma nigrescent. Probably not uncommon; I have seen it from Bengal, Bombay and many from Ceylon, as well as single males (which differ only sexually from the ♀) in the British Museum from Sumatra (Ericson, 1898) and northern Borneo (Whitehead, 1892). Cameron's species (cf. also Spolia Zeyl. 1905, p. 127) is certainly synonymous with the present, which Brullé found in "Pile de Java" and which Tosquinet, who gives the length in 1903 as 16 mm. in both sexes against Brullé's female of 23 mm., records from the Monts Tengger in east Java at an altitude of 4,000 feet in 1890.

7. *Paniscus lineatus*, Brullé.

Hist. Nat. Hym. iv, 1846, 157, ♀.

Possibly = *Parabatus virgatus*, Fourc., or (on account of its large size) *P. amplus*, Morl.

8. *Paniscus testaceus*, Grav., var. *opaculus*, Thoms.

P. longitarsis, Cam., Manch. Mem. 1899, p. 108, ♂; var. *ocellaris*, Thoms. = *P. ferrugineus*, Cam., l.c., p. 107, ♂.

Assam, Bengal, Ceylon, Bombay, Simla, Kashmir, Punjab, Bhutan, North-west Provinces, Sikkim, Darjiling, Lower Burma, Calcutta, Mussoorie, Bangalore. Not only that wide range, but I have seen it from Penang (Bowring, 1861), Lhasa in August-September, 1904 (Thibet Expedition), Kanshirei in Formosa during May, 1908 (Wileman), and from Yokohama during November, 1889 (Hon. W. Rothschild), in the British Museum.

9. *Paniscus quadrilineatus*, Smith.

Scient. Res. 2nd Yarkand Mission 1878, p. 22, ♀.

Known by its four flavous mesonotal vittae, but otherwise insufficiently described; length, 15 mm. I have seen a single ♀ in the Calcutta Museum agreeing with this mesonotal coloration, but with the stripes deep fulvous (not at all flavous, as described by Smith from a spirit specimen, which was returned to India, though I know nothing further of its history) and the areolet most remarkable and elongately petiolate. Waterhouse's figure (Aid. Ident. Ins. 1885, pl. 162, fig. 2) shows that the basal nervure is not continuous through the median. Smith's *P. unicolor* of 1878—*nec* 1874—has been termed by me (Fauna of India, Ichn.) *P. renovatus*, but it was quite inadequately described from "Murree, Punjab hills."

10. *Paniscus orientalis*, Cam.

Spolia Zeylanica 1905, p. 126, ♀.

Similar to, though larger than, *P. intermedius* and differing therefrom in its deeper rufescent coloration, the nervellus intercepted nearer its centre, scutellar carinae not apically coalescent, vertex broader and less obliquely constricted posteriorly and in the metapleural carinae being much more broadly developed. Only known, with any degree of certainty, from Ceylon, till Mr. N. B. Kinnear showed it me from Belgaum in Bombay, where he found it on 4th September, 1910.

11. *Paniscus gracilipes*, Thoms, var. *formosus*, var. nov.

Ophion unicolor, Smith, Trans. Ent. Soc. 1874, p. 397, ♂ (*sic* ♀); *nec* Proc. Linn. Soc. v, 1861, p. 141.

A second ♂ *Paniscus* from Hiogo in Japan, in the British

Museum, is labelled "type" of his *Ophion unicolor* by Fred Smith. It is altogether distinct from his *Paniscus* of that name, being very narrow behind the eyes, much more slender and paler, with less ample wings. I consider it an oriental form of Thomson's species, of which it may be termed var. *formosus*, differing in nothing but its paler coloration and smaller subtransverse areolet; a second ♂ of this form was captured by A. E. Wileman at Kanshiri in Formosa on 6th March, 1908.

12. *Paniscus capito*, Kok.

Horae Soc. Ent. Ross. 1899, p. 132, ♀.

Superficially similar to *P. gracilipes* but at once known by the broad vertex, with the temples as broad as the eyes; and very distinct from allied species in the strongly oblique nervulus, entirely margined scutellum and obsolete notauli. Kokujew's type is from Transcaucasia. In 1911 the Hon. W. Rothschild presented a ♀ to the British Museum, labelled "19 July 1905, Bir-bash, north eastern shore of Issykkul," which is a lake in Russian Turkestan.

13. *Paniscus flavolineatus*, Cam.

Paropheltes flavolineatus, Cam., Journ. Bombay Nat. Hist. Soc. 1907, p. 111, ♀.

So far from representing a new genus, this species the type of which, taken at Ferozepore, I have examined in Col. Nurse's collection, is extremely closely allied to *P. fuscicornis*, Holmgr. and *P. brachycerus*, Thoms.; but it is larger with conspicuous flavescent markings. Cameron was led into error by entirely overlooking the stout and very obvious tarsal pectination.

14. *Paniscus montanus*, Cam.

Journ. Bombay Nat. Hist. Soc. 1906, p. 291, ♀; *P. kashmirensis*, Cam., *l.c.*, p. 292, ♀.

The facies of this species exactly corresponds with that of *P. opaculus*, Thoms., though it is at once known by the remarkably elongate and acuminate central labral spine, as long as the unusually exserted labrum, which is turn is hardly shorter than the clypeus. The types of Cameron's two species, which I have seen in Nurse's collection, bear identical labels and were presumably taken in company; their synonymy is indubitable. I have seen the male from Bangalore; it differs only sexually.

I have here failed to tabulate three of Szépligeti's recent species; these are *Paniscus celebensis*, Ann. Mus. Hungr. iv, 1906, p. 154; *P. novoguineensis*, l.c.; and *P. javanus*, Leyden Mus. Notes xxix, 1908, p. 258; which I do not know.

TABLE OF AUSTRALASIAN SPECIES.

- | | | |
|------|--|--------------------------------|
| (8) | 1. Areolet thrice longer than broad; stigma nearly always dark | |
| (7) | 2. Stigma nigrescent; size at least 15 mm. | |
| (4) | 3. Second recurrent nervure unifenestrate; eyes black. | 1. <i>latro</i> , Holmgr. |
| (3) | 4. Second recurrent bifenestrate; eyes often ochraceous. | |
| (6) | 5. Metanotum not carinate; first flagellar joint but little longer than second. | 2. <i>constrictus</i> , sp. n. |
| (5) | 6. Metanotum centrally carinate; first flagellar joint once and a half longer than second. | 3. <i>incommunis</i> , Szépl. |
| (2) | 7. Stigma stramineous; size 10 mm. | 4. <i>gracilis</i> , sp. n. |
| (1) | 8. Areolet normal, not strongly elongate; stigma often pale. | |
| (12) | 9. Thorax wholly or mainly black. | |
| (11) | 10. Head but little narrower than eyes; thorax mainly testaceous; stigma black. | 5. <i>ephippiatus</i> , Smith. |
| (10) | 11. Head strongly constricted posteriorly; thorax entirely black; stigma ochreous. | 6. <i>dimidiatus</i> , sp. n. |
| (9) | 12. Thorax not, or but obsoletely, black-marked. | |
| (16) | 13. Stigma deep red; nervellus strongly postfurcal. | |
| (15) | 14. Centre of areolet externally produced; nervellus parallel with basal nervure. | 7. <i>productus</i> , Brullé. |
| (14) | 15. Centre of areolet not produced; nervellus not parallel. | 8. <i>contrarius</i> , sp. n. |
| (13) | 16. Stigma pale testaceous; nervellus usually subopposite. | |
| (18) | 17. Metathorax strongly transbicarinate; not aciculate. | 9. <i>antipodum</i> , Vachal. |
| (17) | 18. Metathorax transaciculate, with only small cristulae. | 10. <i>testaceus</i> , Grav. |

1. *Paniscus latro*, Holmgr.

Eugenies Resa. Ins. 1868, p. 412, ♂; *P. samoanus*, Kohl, Wien Denkschr. Ak. Wiss. 1908, p. 314, pl. iii, figg. 17 et 20, ♂ ♀.

Distinct in the peculiarly narrow areolet, which is thrice longer than broad at its widest part and emits a unifenestrate recurrent nervure; the nervures are distinctly darker than the stigma, and the length 15-17 mm. Some forty examples were known to Kohl, when describing this species from Upolu Island, where they were taken between March and December, 1905, by Dr. Karl Rechinger of the Vienna Museum (l.c., p. 197). [He also—and only, as far as Ichneumonidae is concerned—took four specimens of *Henicospilus*, described as

so many species by Kohl, *l.c.*] I find no distinction between Kohl's species and *Paniscus latro*, Holmgr. from Guam in the Ladrone Islands, to which it must fall on grounds of priority.

2. *Paniscus constrictus*, sp. n.

I should certainly have considered a ♂, taken by G. Turner at Mackay in Queensland and presented to the British Museum in 1892, to represent the last species were it not that the second recurrent is here broadly bifenestrate and the stigma strongly nigrescent; the flagellum and stemmaticum are concolorous but the remainder of the head, including the eyes, is pale, like the whole remainder of the body, excepting a small post-tegular black spot.

3. *Paniscus incommunis*, Szépl.

Ann. Mus. Hungr. iv, 1906, p. 154, ? ♂.

Flavious-red; head posteriorly narrow, rounded and margined; clypeus short; ocelli nigrescent and not approximate *inter se*; antennae as long as body with flagellum piceous and its first joint one and a half times the length of the next; mesonotum shining, with elongate notauli; mesopleurae dull and punctate; metanotum rugose and transaciculate, with strong carina down its centre; scutellum margined; wings hyaline, with nervures and stigma black; nervulus strongly postfurcal and vertical; first abscissa of radius in hind wings a little more than double length of the transverse cubital; length, 15 mm. This differs from *P. constrictus* in its distinctly longer basal flagellar joint, the metanotal carina, vertical nervulus and longer second recurrent of the hind wings. Described from Yorke Town, in South Australia.

4. *Paniscus gracilis*, sp. n.

Instantly known from all the other species of this region by its small size of hardly 10 mm. and very narrow areolet, which is elongately petiolate above, with its sides also coalescent below. It is to be known from *P. gracilipes*, Thoms., only by the small areolet, black ocellar region and subinfusate antennae, and is in all probability no more than a geographical form of that species. Superficially it resembles *Parabatus gracilis*. A single female was captured by Rowland Turner during May, 1900, at Mackay, in Queensland.

5. *Paniscus ephippiatus*, Smith.

Trans. Ent. Soc. 1876, p. 478, et *l.c.* 1878, p. 3, ♀.

These two descriptions are certainly synonymous though it appears a little ambiguous whether Smith intended them to be so regarded; the female types of both are in the British Museum from Canterbury (Wakefield) and Dunedin, in Otago (Hutton), in New Zealand. The species is recognised with facility by the invariably deep black meso-notum and -sternum, and by the black stigma combined with the unusually broad areolet. Dalla Torre has regarded Smith's two descriptions as distinct, but Prof. Hutton in copying both in his "Catalogue of the N.Z. Diptera, Orthoptera, Hymenoptera; with Descriptions of the Species" in 1881, thought they referred to but one. Cameron knew a specimen from Greymouth and regarded it as apparently a common species (Manch. Mem. 1898, p. 35); the British Museum has a dozen examples from Auckland in 1854 (Col. Bolton), New Zealand in 1903 (E. Arnold), Wellington on 12th and 26th December, 1909 (A. H. Cockayne), etc.

6. *Paniscus dimidiatus*, sp. n.

This species bears a most remarkable resemblance to the distinct *P. insulicola* from St. Helena; and I should have been tempted to suspect an error in the type-locality—indicated only as Australia—were it not that the stigma is very pale and translucent ochraceous, the wings are distinctly larger in proportion, and the brachial cell is longer; length 16 mm. One ♀ only.

7. *Paniscus productus*, Brullé.

Hist. Nat. Ins. Hym. iv, 1846, 156, ♀.

P. foveatus, Cam. Manch. Mem. No. 1, p. 36, ♂ (1898).

This female does not appear to have been recognised since first described, yet the species is both common and instantly known by the outer nervure of the areolet being produced to a more or less appreciable extent immediately above its fenestrate lower half; it is, too, almost the only Australasian species with deep red stigma wherein it is allied to the African *P. capensis* and *P. rufescens*, though its vertex is constantly pale and areolet much larger. Cameron's type of *P. foveatus* (Manch. Mem. 1898, No. 1, p. 36, ♂) from Greymouth is in the British Museum and entirely synonymous, though he had overlooked the produced areolet! The seventeen specimens of both sexes in the British Museum vary from 17-21 mm.

in length and are from "la terre de Van Diemen," taken by the Rev. A. Beaufort in 1838; in the south east of the island by E. D. Atkinson in 1877, and from Hobart by A. M. Lea in 1904. From Australia, taken in the Western state in 1842 by G. F. Moore; at Ballarat on 10th May, 1891, by W. W. Froggatt; in the north of Victoria by C. French; at Toowoomba in Queensland during 1893 by G. A. Higlett; at Hermannsberg in central Australia in 1909, and a pair at Killalpanima, a hundred miles east of Lake Eyre, in 1905 by H. J. Hillier. From New Zealand there are no other certain localities; there are examples from Christchurch (Clark). Besides these are a couple of females, found by H.M.S. "Herald" in the Pacific in 1856.

8. *Paniscus contrarius*, sp. n.

I must regard as distinct from the last species a single female, taken by Rowland Turner at Mackay, in Queensland during April, 1892, though it differs in nothing but the simple, not externally produced, areolet and the strongly oblique nervulus, the lower extremity of which is much further from the radix than the upper, whereas in *P. productus* the reverse is the case. Type in the British Museum.

Paniscus antipodum, Vachal.

Revue Ent. xxvi, 1907, p. 120, ♂ ♀.

Rufescent and impunctate; face more or less flavidous, eyes black and internally emarginate with their external orbits flavous; ocelli subhyaline; mesopleurae bisected by a fine horizontal sulcus; metathorax strongly and a little obliquely transcarinate, except centrally, at its basal and apical thirds; terebra 3 mm. in length, *i.e.* as long as the broadest part of abdomen, and hardly at all attenuate apically; valvulae of ♂ half that length; wings more or less hyaline with rufescent nervures; nervulus distinctly postfurcal; length 16-17 mm. It differs from *P. testaceus*, Grav., in its metathoracic sculpture; and from *P. productus* in its lack of thoracic flavous markings and the absence of metanotal transaciculation. Its facies is remarkably like that of *Parabatus antipodum*. Both sexes were taken by Lieut. Quod in New Caledonia.

10. *Paniscus testaceus*, Grav., var. *opaculus*, Thoms.

Several females were found at Mackay in Queensland by Rowland Turner during June, 1897, May, 1900, and March,

1901, which I cannot distinguish from German examples of this species; others are from Herbert River in N.E. Queensland in 1887 (Mrs. Burgess), Lower Plenty in Victoria in 1858 (R. Bakewell), and Van Diemen's Land in 1854 (M. Allport) and 1877 (A. Simson); the Tasmanian specimens are distinctly a little more rufescent.

PARABATUS, Thomson.

Opusc. Ent. XII, 1888, 1194.

Known from *Paniscus* only by the continuous basal nervulus through the median nervure, thus forming both the upper and lower basal nervures of a single line; this I do not find always associated with an occipital costa, and have been obliged consequently, to place species with this capital structure occasionally in the genus *Paniscus*. Thomson originally placed four Swedish species in the present genus and others were subsequently added; but Szépligeti, for some occult reason, has restricted Thomson's genus to a single species (Genera Insectorum 1911, p. 76), the first here placed by its author, which differs from the other three in little more than the aborted areolet; and, further, he has synonymised—entirely arbitrarily, I think—Ashmead's nearctic genus *Opheltoideus* (Proc. U.S. Nat. Mus. 1900, p. 95), with its single and still MS. species, *O. johnsoni*. I have already pointed out (Revis. Ichn. Brit. Mus. I., 60) that the latter almost certainly appertains to the *Anomalides*.

TABLE OF EXTRA-EUROPEAN SPECIES.

- (8) 1. Lateral metathoracic cristulae obsolete; stigma flavescent and usually narrow.
- (3) 2. Stout species; stigma broad; thyridii deeply impressed.
1. *deceptor*, sp. n.
- (2) 3. Slender species; stigma narrow; thyridii obsolete.
- (5) 4. Scutellum margined throughout; body and legs ferrugineous.
2. *whymperi*, Cam.
- (4) 5. Scutellum not margined throughout; body and legs pale testaceous.
- (7) 6. Mesonotum with three dark vittae; scutellum margined to centre; larger, 12 mm.
3. *gansuanus*, Kok.
- (6) 7. Mesonotum immaculate testaceous; scutellum not at all margined; smaller, 10 mm.
4. *gracilis*, sp. n.
- (1) 8. Lateral metathoracic cristulae strong; stigma red and not narrow.
- (18) 9. Nervellus intercepted distinctly above its centre.
- 11) 10. Head and thorax broadly white-marked; stigma luteous.
5. *albipictus*, Tosq.

- (10) 11. Head and thorax not at all white-marked ; stigma red.
 (15) 12. Lower basal nervure (nervellus) subantefurcal.
 (14) 13. Lateral metathoracic cristulae normal. 6. *antefurcalis*, Szépl.
 (13) 14. Metathoracic cristulae cariniform across dorsum.
 7. *antipodum*, sp. n.
 (12) 15. Lower basal nervure continuous with the upper.
 (17) 16. Nervures surrounding stigma distinct ; thorax immaculate.
 8. *luteolus*, Tosq.
 (16) 17. Nervures surrounding stigma not traceable ; thorax with
 three black vittae. 9. *virgatus*, Fourc.
 (9) 18. Nervellus of hind wing intercepted at its centre.
 10. *amplus*, sp. n.

1. *Parabatus deceptor*, sp. n.

With his single female of *Paniscus subfuscus* (*supra*), Redman took in Nova Scotia many years ago—before the British Museum Registers began, about 1838—a ♂ *Parabatus*, differing from the common palaearectic *P. cristatus*, Thoms., in nothing but its shorter and stouter antennae, lack of lateral scutellar carinae, of metanotal transcarina, with the apophyses distinctly obsolete ; length 13 mm.

2. *Parabatus whymperi*, Cam.

Entom. 1903, p. 160, ♀.

The unique female from Chimborazo in Ecuador is a dark ferrugineous and slender insect with very ample but apparently subimmature wings, of which the stigma and all apical nervures are pale stramineous ; the legs and broken antennae are concolorous with the body ; the head subcubical and posteriorly very nearly as broad as the eyes, with which the ocelli are contiguous, though discreted *inter se*. The type was acquired by the British Museum in 1903.

3. *Parabatus gansuanus*, Kok.

Revue Russ. d'Entom. 1906, p. 166, ♂.

The type of 12 mm., from Atu-lunva in the Chinese province of Gansu, has the lateral costae of the metathorax obsolete behind ; the stigma somewhat narrow, and the wings hyaline with their stigma flavidous and almost transparent. ♂ only.

4. *Parabatus gracilis*, sp. n.

Immaculate testaceous. Head flavous with ocelli alone black, and so narrow behind the eyes as to render the vertex

posteriorly obsolete; ocelli not large, subcontiguous with eyes, which reach mandibular base; clypeus convex and apically subtruncate. Antennae testaceous, not very slender and but slightly attenuate apically. Thorax shining, finely and diffusely punctate; mesonotum not dull, with notauli weak though elongate; metathoracic cristulae wanting. Scutellum convex and obsoletely punctate, neither elongate nor at all laterally margined. Abdomen immaculate with obsolete longitudinal sulcus on basal segment, which is as long as the terebra; the second segment basally impressed. Wings broad, with the flavous stigma somewhat narrow; areolet triangular, not small, and not or hardly petiolate. Length, 10 mm. The above description is comparative with that of *P. gansuanus*, which it appears to closely resemble, though it is not to be superficially distinguished from *Paniscus gracilis* and *P. gracilipes*. Turner took a single ♀ during March, 1900, at Mackay in Queensland.

5. *Parabatus albipictus*, Tosq.

Mem. Soc. Ent. Belg. 1896, p. 410, ♂.

“La nervure transverse ordinaire est presque interstitiale.” Fulvous with white markings, very finely punctate; head dead white and not posteriorly constricted; face quadrate and apically subconstricted, centrally fulvous and subconvex; ocelli subcontiguous with eyes; antennae slender and red; thorax with pronotum, mesonotal vittae, pleural sutures and marks, white; notauli not deeply impressed; metathorax obsoletely trans-striate, with lateral cristulae small; scutellum triangular and discally subdeplanate, with basal carinae and its sides white; abdomen immaculate fulvous, paler below and at its extreme base; wings somewhat large, hyaline with stigma pale luteous; radix and tegulae white; areolet small and very narrow, triangular and a little petiolate; basal nervure subcontinuous; nervellus intercepted above its centre; length 10 mm. A male from Delagoa Bay. There are two more males, with no mesothoracic white marks, from the Athi River in British East Africa, May, 1899 (C. S. Betton) and Bohotle in Somaliland in 1903 (Major Appleton), in the British Museum.

6. *Parabatus antefurcalis*, Szépl.

Sjöstedt's Kilimandjaro Exped. II, 1910, 90, ♀.

Said to differ from *Paniscus rufescens*, Tosq., only in the position of the lower basal nervure, which is antefurcal, though nearer the upper basal than its own length.

7. *Parabatus antipodum*, sp. n.

M. J. Vachal, in describing his *Paniscus antipodum* writes : " la nervure basale naissant bien avant la transversale ordinaire," and thus renders that species' inclusion in the present genus impossible. In all other respects his description agrees exactly with a fine female and a couple of males in the British Museum, excepting only that these all measure just 20 mm. in length. They differ from all other species of this genus in their strongly transbicarinate metathorax, which is centrally elevated before its base, as in *Opheltes*. The head is posteriorly as broad as the eyes; the ocellar region is not infuscate; the scutellum is very finely punctate, discally deplanate and only basally margined; the spiracles are prominent at the basal fourth of the apically subthyridiate first segment; the stigma is clear pale orange, the notauli very deeply impressed and the nervellus but very slightly antefurcal. A pair was presented from Victoria in 1885 by F. du Boulay and a ♂ from Melbourne, taken in September, 1900, by C. French.

8. *Parabatus luteolus*, Tosq.

Mém. Soc. Ent. Belg. 1896, p. 401, ♀.

This is similar to *P. cristatus* but larger with a length of 16 mm., the ocellar region black, the stigma very deep red and its margins both above and below "roux foncé," the nervures are identical, the notauli a little more deeply impressed, the head posteriorly narrower, the scutellum much narrower and laterally strongly margined to its apex. In the two British Museum males the lower basal nervure is very slightly antefurcal in that from Annshaw, near King William's Town, and very slightly postfurcal in that taken by Neave in July, 1910, at an altitude of some 2-4,000 feet in the Karonga District of Nyasaland, as well as in two females found by Betton at Lari and Rogora in British East Africa during the summer of 1899.

9. *Parabatus amplus*, sp. n.

A large species with the wings remarkably ample; otherwise very like *Parabatus virgatus* but with both the second recurrent and upper basal nervures less curved, the areolet not or hardly petiolate, the metanotum more deplanate, wings flavescent and nervellus intercepted at its centre; length 15-19 mm.

♂♀. The typical female was taken by A. E. Hobson at an altitude of 4,500 feet at Yatung, in Thibet, and I have seen other specimens of both sexes from India in the Calcutta Museum, taken in Sikkim by Knyvett.

TETRAGONALYS, gen. nov.

This genus is intermediate between the Paniscides and Mesochorides, and appears adequately to fill a very conspicuous gap in our system of classification; not only so, but the two species I place here, sufficiently similar to be at least temporarily regarded as congeneric, each incline structurally to these two groups. The quadrate and very large areolet, above which the radial nervure is not at all arcuate, combined with the testaceous coloration and more or less prominent anal styles, render it abundantly distinct.

TABLE OF SPECIES.

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|--|------------------------------|
| (2) 1. <i>Nervellus</i> intercepted far below centre; metathoracic areae distinct. | 1. <i>barbarica</i> , sp. n. |
| (1) 2. <i>Nervellus</i> intercepted a little above centre; metathoracic areae wanting. | 2. <i>pagana</i> , sp. n. |

1. *Tetragonalys barbarica*, sp. n.

A somewhat large and brightly testaceous, nitidulous species with only the head except the mouth, a dot behind the tegulae and the tarsal claws, black; pronotum and stigma stramineous; anal styles as long as the second hind tarsal joint. Antennae a little shorter than the body. *Nervellus* antefurcal; discoidal nervure strongly and the external radial distinctly curved; outer nervure of the petiolate areolet straight; fenestrae of the second recurrent broad and discreted by a dot; metanotal areola hexagonal, emitting distinct costulae near its base; petiolar area strongly discreted; spiracles elongate-oval. Length 14 mm. This unique ♂ is in the British Museum and was captured at Gyangtse in Sikkim during the Thibet Expedition in June, 1904, at an altitude of 13,000 feet.

2. *Tetragonalys pagana*, sp. n.

Very different from the above in structure, though similar in outline, colour and the conformation of both the areolet and basal segment. The antennae are a quarter again as long as the body; the head including ocelli and ocellar region

is testaceous, with the tegular dot and mandibular apices alone black; stigma clear fulvous; ♂ styles obsolete and ♀ terebra exerted, though not extending beyond the anus. Nervellus subpostfural; discoidal nervure and the external radial nearly straight; outer nervure of the sessile areolet strongly curved; fenestra of the second recurrent small and entire; metanotum with no areae, but a very strong transcarina connecting the present apophyses and extending thence to an apical tooth on either side; spiracles oval and elevated, above a longitudinal carina. Length 16 mm. A single pair was bred by C. French from a pupa of the Lepidopteron *Mnesampela privata* Guen., during August, 1900, at Melbourne.

PARCA, gen. nov.

A remarkably distinct genus in its deplanate abdomen, subcentral petiolar spiracles, entire lack of areolet, basally straight external radial abscissa, simple claws, small ocelli and protuberant eyes. It is probably most closely related to *Opheltes*, and is by no means a typical Paniscid, since the scutellum is not at all margined and the alar structure very distinct.

1. *Parca ocularia*, sp. n.

A strongly nitidulous, slender and testaceous species with only the eyes, ocelli, mandibular apices, flagellum, terebral valvulae, hind tarsi, stigma and costa, black; anus, with both hind femora and tibiae, subinfusate; metanotum glabrous, mesopleurae punctate. Length, 11 mm. I possess a couple of females, collected at Kandy in Ceylon by E. E. Green and O. S. Wickwar during June and September, 1909.

OPHELTES, Holmgren.

Sv. Ak. Handl. 1858, P. VIII, p. 30.

Tenthredinid parasites appear anachronous in the present group, with which this genus is too naturally related in structure to be relegated to the *Tryphonini*; yet there is a good deal of analogy in its conformation, and especially that of the buccate cheeks and temples, with *Scolobates*, which in its turn was considered to be Ophionidous by Holmgren. In this latter respect, and that only, *Opheltes* may be considered related to *Westwoodia*.

1. *Opheltes glaucopterus*, Linn.

This is a widely distributed and well known species ; it is said to occur on umbelliferous flowers in August, and in June in Germany where it has been often captured at light and seen flying round alders as late as October. It is recorded from Sweden, France, Holland, Italy, and I have females taken by Montandon at Bucharest and on the Dobrudja in Roumania, together with a single example of the undescribed male of the southern var. *fuscipennis*, Grav. (I.E. III, 1829, 635), which differs in nothing but its anal appendages from its female and both from the type form only in their deeply infumate wings. This insect has long been known to be parasitic upon species of the Tenthredinid genus *Cimbex* : it was bred from *C. variabilis* (= *femorata*) by Hartig (Jahresb. 68), on 20th May, 1832, by Drewsen (Wiegmann. Arch., II, p. 38), and a ♂ on 30th May, 1849, by Brischke (Ratz. Ichn. d. Forst. III, 80) ; by Giraud both from that species and *Cimbex axillaris* (= *humeralis*) (Ann. Soc. Ent. France, 1877, p. 406) ; Siebold raised it from eggs deposited in *C. connata* by a virgin mother (Ent. Nachr. 1884, p. 95) and Mocsáry from *C. lutea* ; while Provancher bred it in Canada from *C. americana*, Leach.

In the British Museum are some forty examples of this conspicuous insect, comprising only two males. The palae-arctic specimens, from Germany, Switzerland and Digne, vary only in having the black covering the whole of the sternum with meso- and meta- pleurae to the whole thorax except scutellum and the mesonotum deep black, and the latter with a black longitudinal vitta ; the anus from the fifth segment except ventrally, ocellar region and mandibular apices are always black and the hind coxae not infrequently concolorous basally on their inner side. On the other hand the few nearctic females (which have right to no more than a colour-varietal rank under the name *flavipennis*, Prov. Nat. Canad. VI, 1874, p. 143) more usually have the mesonotum black throughout or with but two red vittae ; the metathorax in all I have seen thence is entirely black, as also or for the most part are the hind coxae. These are from Albany River, Hudson's Bay, 1844 (Geo. Barnston), New Jersey in 1889 (H. Edwards), the United States in 1891 (Miss Phipson), and the Monacknock Mountains in New Hampshire in 1911. (Hon. W. Rothschild). The var. *fuscipennis* is poorly represented by a single pair from Zante in the Ionian Isles, May, 1889 (Schmiedeknecht) and Armentière in Avignon,

where Dr. Chobaut doubtless erroneously considered he had bred it from the longicorn beetle, *Necydalis major*, Linn. (Rev. T. A. Marshall).

2. *Opheltes chinensis*, sp. n.

Body infusate ferrugineous, with the thorax mainly nigrescent; antennae and head, except the ocellar region, red; hind tarsi white, and wings clear hyaline with the stigma and costa dark ferrugineous. The scutellum is not laterally margined; the cheeks are elongate and, like the temples, strongly buccate; metanotum deeply sulcate basally, areolet exactly as in the last species, but the whole insect is smaller and darker, with the wings less apically acuminate. Length, 15 mm. ♂ only.

This remarkable species differs from *O. glaucopterus* in lacking notauli; metanotum longitudinally carinate though hardly elevated basally, and thence obliquely carinate to apex; metathoracic spiracles oval and not elongate, stigma shorter and broader, radial nervure hardly basally and not at all apically curved, lower basal nervure but very slightly postfurcal; nervellus intercepted at its upper fourth. A single male, in the British Museum, is labelled "Northern China," but was more probably taken about Shanghai, by Mr. Fortune and acquired in 1854.

WESTWOODIA, Brullé.

[I have introduced this genus here solely for the following remarks.]

1. *Westwoodia ruficeps*, Brullé.

Hist. Nat. Ins. Hym. iv, 1846, 127, pl. xli, fig. 2, ♀.

This extremely aberrant species does not appear to have been noticed in literature since first described, though a second species—not considered by me to be congeneric—was brought forward by Provancher (Nat. Canad. 1875, p. 329) from Canada and, later, from the United States of America. Brullé's female figure is fairly representative, though the antennae are much too slender and the head not sufficiently buccate behind the eyes; moreover, the alar details are entirely erroneous for the wing is apically sub-acuminate with the areolet triangular, emitting the recurrent nervure distinctly beyond its centre; this second recurrent is broadly fenestrate but not at all sinuate, and the lower

basal nervure is but slightly postfurcal. In the British Museum are two females acquired from "Australia"—probably from the Victorian collection of Dr. Bakewell—in 1866; and another from the same vague locality received from Peter Cameron in 1899. The male is so dissimilar that at first I regarded it as probably distinct:—the frontal horn is obsolete, the antennae are longer, the legs both longer and more slender with the anterior femora not incrassate, the radius is apically straight and the areolet emits the second recurrent distinctly before its centre, the basal nervure is continuous, or but slightly postfurcal, through the median and the nervellus is intercepted distinctly above its centre and not, as in ♀, at or below the centre. In all, but the example from Cameron, the two basal segments are red. Of this ♂ the British Museum contains two from Adelaide (ex coll. Smith) 1879, and from near Melbourne in Victoria (ex coll. French).

Respecting its affinities: it was originally placed by Brullé between *Banchus* and *Exctastes*; Ashmead in 1900 relegated it to the sessile-bodied *Tryphonini* and Dalla Torre in 1901 left it there, between *Labrossyta* and *Protarchus*: though the whole structure of the head, thorax and abdomen allies it to a remarkable degree to *Scolobates*, from which position it is precluded by its simple tarsal claws and strong areolet. A peculiar feature of the genus is the somewhat narrow abdominal petiole, rendered strongly explanate and broadly sessile by the dilated lateral membrane. Without this membrane the petiole is (as in certain *Apanteles*) parallel-sided, half as long again as basally broad, and as long as the quadrate postpetiole; or, in ♀, narrower but slightly explanate throughout. The narrow petiole admits of affinity with the *Ophioninae*, where the strongly buccate head with its small eyes, immarginate scutellum and equally bidentate mandibles are similar to those of *Opheltes*.

INDEX.

- acheron (Exochilum), 72, 79.
 acronyctae (Exochilum), 71, 74.
 aethiopicus (Paniscus), 113, 118.
 africanus (Podogaster), 60, 62.
 agnatum (Anomalon), 85.
 agrestoria (Echthromorpha), 38, 44.
 agrestorius (Ichneumon), 44.
 Agrypon, 50, 89.
 alaskensis (Paniscus), 103, 108.
 — (Rhyssa), 9, 11.
 albicoxa (Trichomma), 63, 65.
 albiditarsus (Podogaster), 60, 61.
 albipictus (Parabatus), 128, 130.
 albofacialis (Pharsalia), 99.
 albomaculata (Rhyssa), 10.
 albopicta (Lissopimpla), 34, 36.
 — (Pimpla), 36.
 albotarsus (Paniscus), 103, 109.
 albovariegatus (Paniscus), 103, 109.
 alternata (Epirhyssa), 8.
 amazonica (Epirhyssa), 8.
 ambiguum (Anomalon), 85.
 amicta (Schizoloma), 66, 67.
 amplus (Parabatus), 129, 131.
 anale (Anomalon), 85, 87.
 annulatum (Eiphosoma), 51, 53.
 annulatus (Certonotus), 27, 31.
 ANOMALIDES, 49-99.
 Anomalon, 50, 82.
 antefurcalis (Parabatus), 129, 130.
 antipodum (Paniscus), 124, 127.
 — (Parabatus), 129, 131.
 — (Rhyssa), 15.
 Apechoneura, 3, 22, 23.
 Aphanistes, 82.
 apicalis (Certonotus), 28, 31.
 apicate (Anomalon), 83, 84.
 approximator (Rhyssa), 12, 13.
 atrata (Echthromorpha), 38, 41.
 — (Thalessa), 15, 16.
 atratus (Ichneumon), 15.
 atrichiosoma (Exochilum), 72, 77.
 Atrometus, 94.
 atrovittatum (Eiphosoma), 51, 52.
 australasiae (Exochilum), 72, 75.
 azteca (Eiphosoma), 51, 52.
 barchan (Tetragonalys), 132.
 Barylypa, 50, 80.
 bimaculata (Epirhyssa), 5, 7.
 binghami (Anomalon), 83, 84.
 bipartita (Barylypa), 80.
 bitecta (Echthromorpha), 37, 39.
 bituberculatum (Trichomma), 64.
 brachypterum (Anomalon), 83.
 brasiliensis (Paniscus), 103, 104.
 — (Xiphosomella), 57.
 brevicauda (Apechoneura), 23, 26.
 brevicorne (Exochilum), 72.
 buccatum (Anomalon), 84, 86.
 bucephalum (Schizoloma), 67.
 calcator (Heteropelma), 68, 69.
 calignosum (Agrypon), 90, 91.
 canadensis (Rhyssa), 9, 12.
 capitata (Schizoloma), 66, 67.
 capito (Paniscus), 119, 123.
 carinifrons (Anomalon), 83.
 — (Apechoneura), 22, 24.
 — (Epirhyssa), 5, 6.
 cephalotes (Paniscus), 113, 116, 119, 121.
 Certonotus, 3, 26.
 ceylonicus (Paniscus), 121.
 chinense (Exochilum), 71, 74.
 chinensis (Opheltes), 135.
 circumflexum (Exochilum), 72, 76.
 claripennis (Rhyssa), 12, 14.
 clavata (Pimpla), 16.
 clavula (Rhyssa), 15.
 coarctatum (Anomalon), 88.
 coarctatus (Podogaster), 60.
 concolor (Lissopimpla), 34, 35.
 confusa (Schizoloma), 66.
 conopleura (Echthromorpha), 38, 42.
 constrictus (Paniscus), 124, 125.
 continua (Pimpla), 45.
 continuum (Polyamma), 46.
 contrarius (Paniscus), 124, 127.
 curtum (Anomalon), 84.
 datanae (Heteropelma), 68, 69.
 deceptor (Parabatus), 128, 129.
 decimnotata (Lissopimpla), 34.
 decorum (Anomalon), 83.
 diabolus (Exochilum), 71, 73.
 dimidiatum (Nesanomalon), 56.
 dimidiatus (Paniscus), 124, 126.
 diversor (Echthromorpha), 38, 47.

diversus (*Paniscus*), 104, 110.
doreica (*Rhyssa*), 19.

Echthromorpha, 33, 36.
 ECHTHROMORPHIDES, 33-48.
Eiphosoma, 49, 51.
elegans (*Anomalon*), 89.
 — (*Paniscus*), 113, 116.
 — (*Spilanomalon*), 89.
eneicator (*Trichomma*), 63, 64.
ephippiatus (*Paniscus*), 124, 126.
Epirhyssa, 3, 4.
Erigorgus, 50.
errans (*Paniscus*), 112, 113
Exochilum, 50, 71.
exquisita (*Echthromorpha*), 37, 40.

fasciata (*Rhyssa*), 12, 13.
ferrugineum (*Agrypon*), 93.
 — (*Anomalon*), 85.
ferrugineus (*Paniscus*), 122.
flaviceps (*Agrypon*), 94, 95.
 — (*Certonotus*), 28, 31.
 — (*Rhyssa*), 31.
flavifrons (*Agrypon*), 90.
 — (*Anomalon*), 90.
flavitaris (*Barylypa*), 81.
flavobalteata (*Epirhyssa*), 5, 7.
flavolineatus (*Paniscus*), 119, 123.
 — (*Paropheltes*), 123.
flavo-orbitalis (*Echthromorpha*), 38, 42.

flavopicta (*Epirhyssa*), 5, 6.
flavopictum (*Agrypon*), 94, 96.
flavo-pictus (*Macrogaster*), 6.
formosus (*Paniscus gracilipes*), 122.
foveata (*Apechoneura*), 22, 23.
foveatus (*Paniscus*), 126.
fractinervis (*Rhyssa*), 15.
fulva (*Rhyssa*), 12, 13.
fulvicorne (*Heteropelma*), 68.
fulvicornis (*Schizoloma*), 66, 67.
fulvidens (*Trichomina*), 63, 64.
fulvipennis (*Rhyssa*), 12, 14.
fulvitarse (*Heteropelma*), 68, 70.
fumipenne (*Anomalon*), 85, 86.
fuscipennis (*Exochilum*), 71, 74.
 — (*Paniscus*), 104, 111.

gansuanus (*Parabatus*), 128, 129.
geminatus (*Paniscus*), 103, 104.
geniculatus (*Certonotus*), 27, 28.
gerlingi (*Paniscus*), 103, 106.
giganteum (*Exochilum*), 72, 77,
glaucopterus (*Opheltes*), 134.
gnathon (*Echthromorpha*), 37, 41.
gracilipes (*Paniscus*), 119, 122.
gracilis (*Paniscus*), 124, 125.

— (*Parabatus*), 128, 129.
gruni (*Paniscus*), 119, 120.
guatemalenum (*Anomalon*), 85, 87.

Heteropelma, 50, 68.
hinnuleus (*Certonotus*), 28, 32.
histrio (*Epirhyssa*), 8.
humeralifer (*Certonotus*), 28, 31.
humida (*Rhyssa*), 9, 11.
hyalina (*Echthromorpha*), 39, 48.
hyaline (*Anomalon*), 85.
hyalinipennis (*Lytarmes*), 21.
Hymenopharsalia, 98.

ignotus (*Paniscus*), 103, 108.
immaculata (*Echthromorpha*), 38, 42.
immaculatus (*Paniscus*), 103, 109.
incommunis (*Paniscus*), 124, 125.
inermis (*Echthromorpha*), 38, 46.
insidiator (*Echthromorpha*), 38, 44.
 — (*Pimpla*), 44.
instigator (*Rhyssa*), 19.
 — (*Thalessa*), 18, 19.
insulicola (*Paniscus*), 113, 115.
intermedius (*Paniscus*), 119, 120.
intricatoria (*Echthromorpha*), 37, 39.
intricatorius (*Cryptus*), 39.

japonica (*Epirhyssa*), 5.
 — (*Thalessa*), 18.
japonicum (*Anomalon*), 76.

kashmirensis (*Paniscus*), 123.

labialis (*Certonotus*), 27, 30.
Labrorychus, 50.
laevis (*Paniscus*), 119.
lanaria (*Rhyssa*), 12, 13.
Laphyctes, 81.
laterale (*Anomalon*), 85.
latro (*Paniscus*), 124.
lineatus (*Paniscus*), 119, 121.
lineiger (*Agrypon*), 94.
lineolata (*Rhyssa*), 9, 10.
lineolatum (*Cryptocentrum*), 10.
liopleuris (*Paniscus*), 104, 111.
Lissopimpla, 33.
longicauda (*Apechoneura*), 23, 25.
longitarsis (*Paniscus*), 122.
lucidulus (*Paniscus*), 104, 111.
lugubris (*Paniscus*), 104, 112.
lunator (*Ichneumon*), 17.
 — (*Thalessa*), 16, 17.
luteolus (*Parabatus*), 129, 131.

luteopectum (*Anomalon*), 85.
Lytarmes, 3, 21.

macula (*Echthromorpha*), 38, 43.
maculiceps (*Epirhyssa*), 5, 7.
maculicornis (*Epirhyssa*), 5.
maculipennis (*Echthromorpha*), 38, 42.

— (*Lytarmes*), 21.

— (*Thalessa*), 18, 20.

madeirensis (*Paniscus*), 113, 115.
Magnibucca, 50, 79.

magnifica (*Pyramirhyssa*), 3.
magum (*Anomalon*), 85, 88.
major (*Apechoneura*), 23, 25.
maxima (*Echthromorpha*), 37, 40.
medius (*Paniscus*), 103, 108.
Megarhyssa, 15.

melanocotis (*Paniscus*), 113, 115.
melanostigma (*Paniscus*), 104, 111.

melanura (*Agrypon*), 93, 94.

mesopyrrha (*Rhyssa*), 12, 14.

metallicum (*Anomalon*), 85.

Metanomalon, 50, 58.

mexicana (*Eiphosoma*), 32, 54.

— (*Epirhyssa*), 8.

— (*Hymenopharsalia*), 98, 99.

minor (*Apechoneura*), 23, 25.

minuta (*Trichomma*), 63, 65.

minutum (*Anomalon*), 65.

— (*Trichomma*), 65.

mirabilis (*Rhyssa*), 12, 13.

montanus (*Paniscus*), 119, 123.

monticola (*Certonotus*), 27, 29.

morio (*Exochilum*), 71, 73.

mülleri (*Epirhyssa*), 5.

mundus (*Ophion*), 73.

mussouriense (*Anomalon*), 76.

neglectum (*Exochilum*), 72, 76.

Nesanomalon, 49, 56.

nigerrima (*Epirhyssa*), 5, 6.

nigricans (*Echthromorpha*), 38, 43.

— (*Trichomma*), 63, 65.

nigricornis (*Apechoneura*), 22, 23.

nigritarsis (*Apechoneura*), 22, 23.

— (*Rhyssa*), 20, 23.

— (*Thalessa*), 18, 20.

nigritum (*Anomalon*), 85, 86.

nigriventris (*Apechoneura*), 23, 24.

— (*Paniscus*), 119, 121.

nigrobalteata (*Epirhyssa*), 7.

nigrolineata (*Collyria*), 54.

nigrorufum (*Anomalon*), 85, 88.

nigrovittatum (*Eiphosoma vitticelle*), 52, 55.

nigrum (*Exochilum*), 71, 75.

nitida (*Rhyssa*), 16.

— (*Thalessa*), 16.

nitidulus (*Certonotus*), 27, 29.

nobilitator (*Thalessa*), 18, 19.

nodulosus (*Paniscus*), 103, 107.

nortoni (*Rhyssa*), 16.

nototrachoides (*Parania*), 97.

notulatoria (*Echthromorpha*), 38, 45.

notulatorius (*Cryptus*), 45.

nox (*Agrypon*), 90, 91.

— (*Heteropelma*), 68, 70.

occidentale (*Exochilum*), 72, 79.

occisor (*Trichomma*), 63, 64.

ocellaris (*Paniscus*), 113, 116.

— (*Paniscus longitarsis*), 122.

octoguttata (*Lissopimpla*), 34, 35.

ocularia (*Parca*), 133.

opaculus (*Paniscus testaceus*), 103, 107, 117, 122, 127.

Opheltes, 102, 133.

orbitale (*Anomalon*), 85, 87.

— (*Exochilum*), 72, 78.

orbitalis (*Heteropelma*), 68, 69.

orientalis (*Paniscus*), 119, 122.

ornatipes (*Chrysopimpla*), 45.

pacifica (*Lissopimpla*), 33, 35.

pagana (*Tetragonalys*), 132.

pallidilineata (*Echthromorpha*), 48.

PANISCIDES, 101-136.

Paniscus, 101, 102.

Parabatus, 101, 128.

parana (*Eiphosoma*), 51, 53.

Paraneura, 22, 23.

Parania, 50, 96.

Parca, 102, 133.

parvulus (*Paniscus*), 113.

perforator (*Paniscus*), 113, 118.

perforatus (*Bucheckerius*), 117.

— (*Paniscus*), 113, 117.

peritum (*Anomalon*), 85.

perornatum (*Heteropelma*), 68, 70.

persuasoria (*Rhyssa*), 9, 10.

perturbans (*Barylypa*), 81, 82.

Pharsalia, 50, 97.

pietiventris (*Apechoneura*), 23, 24.

plagiata (*Echthromorpha*), 37, 41.

— (*Pimpla*), 41.

planipes (*Paniscus*), 113, 114.

Podogaster, 50, 59.

poliendum (*Metanomalon*), 59.

primum (*Agrypon*), 92.

prismaticum (*Anomalon*), 85.

Pristomerides, 49.

productor (*Trichomma*), 63, 66.

productus (*Paniscus*), 124, 126.

pyralidis (*Eiphosoma*), 52, 54.

- pyramidatus (Exochilum), 77.
 Pyramirhyssa, 3.

 quadrilineatum (Anomalon), 55.
 quadrilineatus (Paniscus), 119, 122.
 quebecensis (Rhyssa), 16.

 regalis (Schizoloma), 66, 67.
 relictum (Anomalon), 85, 86.
 residuum (Agrypon), 94, 95.
 reticulata (Trichomma), 63, 65.
 reticulatum (Heteropelma), 69.
 Rhyssa, 3, 9.
 RHYSSIDES, 3-32.
 Rhyssonota, 4.
 robustum (Exochilum), 72, 78.
 rufa (Echthromorpha), 39, 48.
 rufata (Apechoneura), 22, 23.
 rufescens (Certonotus), 27, 30.
 — (Paniscus), 113, 116.
 ruficaudatus (Podogaster), 60, 61.
 ruficeps (Westwoodia), 135.
 ruficoxis (Trichomma), 63.
 rufipes (Lissopimpla), 34, 36.
 rufus (Certonotus), 27, 30.
 — (Paniscus), 103, 107.

 samoanus (Paniscus), 124.
 scaposum (Exochilum), 72, 75.
 scelerosum (Agrypon), 94.
 Schizoloma, 50, 66.
 scutata (Lissopimpla), 34, 36.
 secundum (Agrypon), 92, 93.
 semilunata (Apechoneura), 23, 24.
 seminiger (Certonotus), 27, 30.
 — (Paniscus), 114.
 semipunctata (Lissopimpla), 33, 34.
 — (Rhyssa), 34.
 semirufum (Anomalon), 85.
 semirufus (Paniscus), 102, 104.
 semperi (Echthromorpha), 39, 48.
 sonorensis (Heteropelma), 68, 69.
 speciosa (Epirhyssa), 8.
 Spilanomalon, 50, 89.
 spilopectus (Podogaster), 60, 61.
 striata (Echthromorpha), 44.
 striatus (Podogaster), 60.
 stupenda (Lissopimpla), 34, 35.
 — (Trichrus), 35.
 subfuscus (Paniscus), 103, 109.
 sulcator (Exochilum), 72, 77.
 sumatrense (Agrypon), 90, 92.
 sumatrensis (Anomalon), 92.
 superba (Ichneumon), 16.
 — (Thalessa), 16.
 superbians (Thalessa), 18.

 szepligetii (Paniscus), 111.

 tabascensis (Xiphosomella), 57, 58.
 tenuipes (Exochilum), 71, 73.
 terminalis (Apechoneura), 23, 26.
 — (Rhyssa), 26.
 testacea (Magnibucca), 80.
 testaceus (Paniscus), 103, 107, 113.
 117, 119, 122, 124, 127.
 Tetragonalyis, 101, 132.
 texana (Eiphosoma), 51, 53.
 — (Hymenopharsalia), 98.
 texanum (Exochilum), 71, 74.
 texanus (Paniscus), 104, 111.
 Thalessa, 3, 15.
 tinetipenne (Anomalon), 83.
 tinetipennis (Paniscus), 104, 110.
 tisiphone (Agryphon), 90, 92.
 trichiosoma (Exochilum), 72, 77.
 Trichomma, 50, 62.
 Trichrus, 33.
 tricoloripes (Epirhyssa), 8.
 tridens (Echthromorpha), 38, 41.
 tridentata (Rhyssa), 19.
 trilineata (Barylypa), 81, 82.
 tristis (Epirhyssa), 8.

 unicolor (Ophion), 122.
 — (Paniscus), 119, 120.

 variegata (Echthromorpha), 38, 46.
 — (Megarhyssa), 20.
 variicolor (Anomalon), 88.
 variilineata (Rhyssa), 12, 14.
 variitarsum (Agrypon), 90, 91.
 varilineata (Rhyssa), 14.
 varius (Certonotus), 28, 32.
 verticale (Exochilum), 72, 78.
 vestigator (Certonotus), 27, 28.
 — (Rhyssa), 28.
 veteratrix (Certonotus), 28, 32.
 victoriana (Barylypa), 81.
 villosum (Agrypon), 90.
 virgatus (Parabatus), 129.
 virginiensis (Hymenopharsalia), 98
 99.
 vitticollis (Anomalon), 85.
 — (Eiphosoma), 52, 55.

 walkeri (Echthromorpha), 38, 42.
 Westwoodia, 102, 135.
 whymperi (Parabatus), 128, 129.

 xanthomelas (Barylypa), 81.
 Xiphosoma, 51.
 Xiphosomella, 50, 57.



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